ANNUAL ENVIRONMENTAL MANAGEMENT REPORT 2023

Whytes Gully Landfill Extension Project

For The NSW Department of Planning and Environment

Wollongong City Council
Waste Services

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Document Information

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Wollongong Waste and Resource Recovery Park (Whytes Gully)

Annual Environmental Management Review 2023

1 Introduction

1.1 Background

WOLLONGONG City Council (the Council) own and operate the Wollongong Waste and Resource Recovery Park (Whytes Gully) located at the base of the Illawarra Escarpment on Reddalls Road, Kembla Grange New South Wales (NSW) (Figure 1 and 2). The facility is licensed by the NSW Environmental Protection Agency (EPA) under the *Protection of the Environment Operations Act 1997 (*POEO Act), Environmental Protection License (EPL) number 5862 (EPL 5862).

In addition to this, as part of the proposed expansion of the facility which included the construction of new landfill cells and leachate ponds under *Section 75J* of the *Environmental Planning and Assessment Act 1979*, Project Approval (Approval No.11-0094) was granted by the Minister for Planning and Infrastructure on 3 April 2013. The approval was subject to conditions stipulated in Schedules 2-5, which, among other things, requires an Annual Environmental Management Review (AEMR) report to be prepared on an annual basis detailing the following:

(a) Operations that were carried out in the past calendar year;
(b) Monitoring results and complaint records of the project over the past year, which includes a comparison of these results against the:
    a. Relevant statutory requirements, limits or performance measures/criteria;
    b. Monitoring results of previous years; and
    c. Relevant predictions in the Environmental Assessment (EA)
(c) Details of any non-compliance over the last year, and description of what actions were (or are being) taken to ensure compliance;
(d) Trends in the monitoring data over the life of the project; and
(e) Actions proposed to be implemented over the following year to improve the environmental performance of the project (including a timeline for completion of each action).

In addition to the above, item (f) states that the Council is required to publish the report on the Council's website within two weeks of its completion.

Two modifications to Project Approval No.11_0094 were also submitted and approved for the new landfill cell, these include:

- Modification 1 (MP 11_0994 MOD1): Modification of operating hours. Approved on 11 April 2018; and
- Modification 2 (MP11_0094 MOD 2): Modification of eastern gully drainage channel alignment to be predominantly outside the landfill footprint. Approved on 29 May 2018.

Modification 3 (MP11_0094) has been submitted to the Department in this reporting period and is currently under review.

Figure 1 Locality Plan

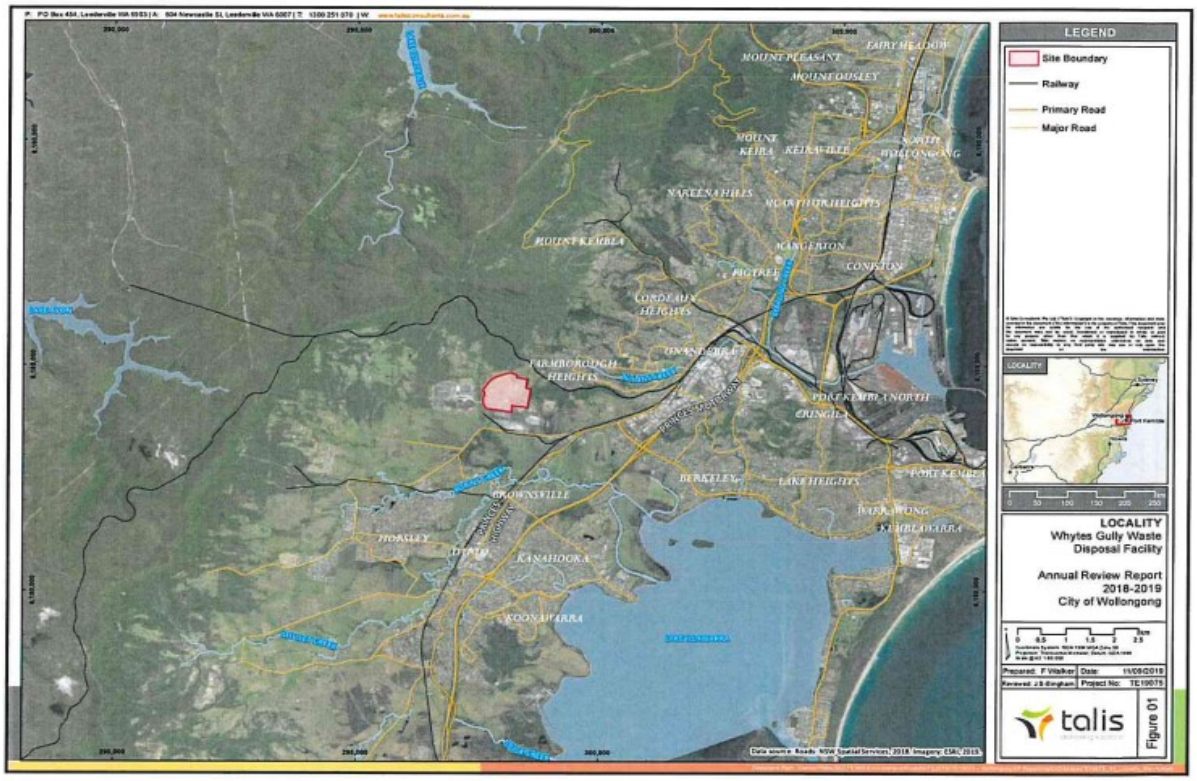
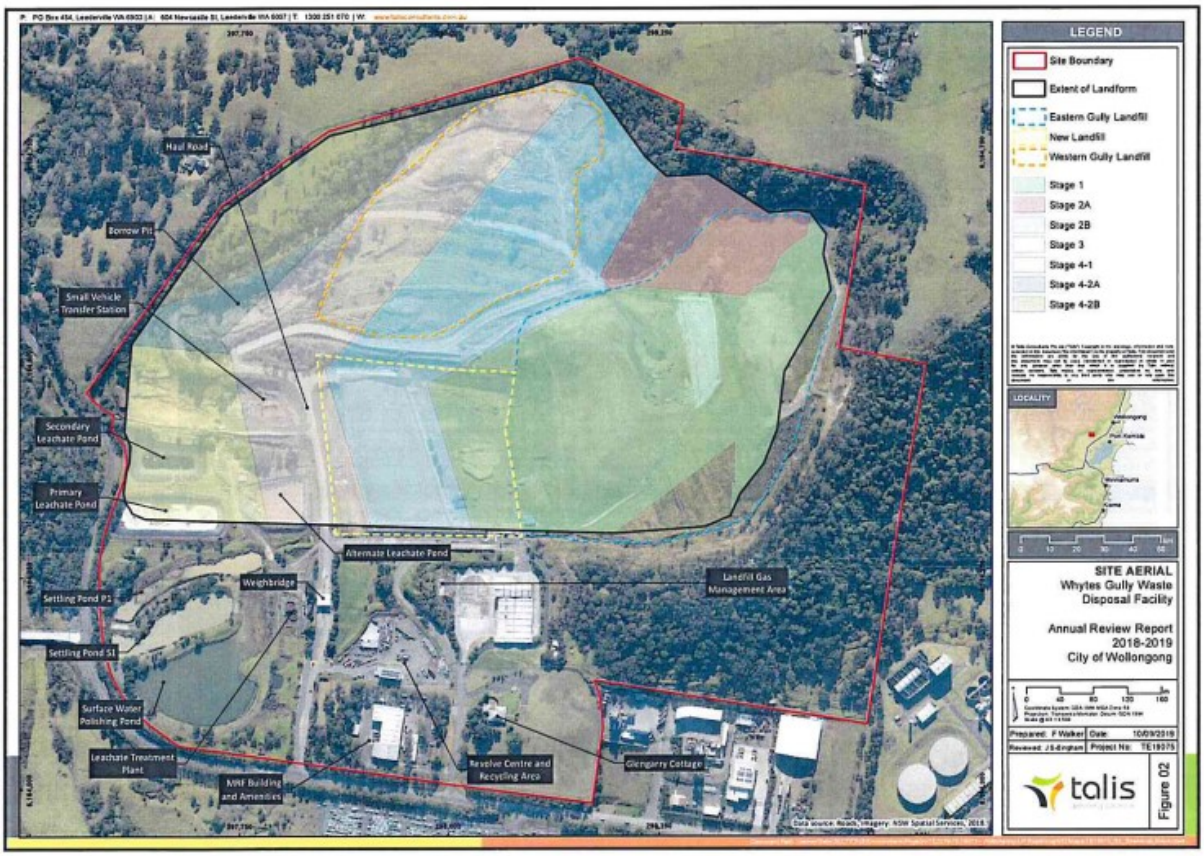


Figure 2 Site Aerial Photograph



1.2 Objectives

The objectives of this AEMR report are to satisfy the Council's Project approval obligations for the 2022/2023 annual reporting period, which will cover 2 March 2022 to 1 March 2023. The compiled monitoring data presented in this AEMR report addresses all aspects stipulated in Section 1.1 (items (a) through to (e)).

Catastrophic rainfall (almost 2500 mm) continued to disrupt normal operations at Wollongong City Council and Waste Services (including Whytes Gully) for the 2022/2023 reporting period. This exceeded the previous reporting period of 2021/2022 where over 1400 mm was recorded at the site.

For an 'Essential Service' such as Waste that runs seven days a week (regardless of weather conditions), ensuring legislative compliance was a significant challenge as outlined in this report. Within this timeframe, three state natural disasters (severe weather and flooding) were declared in the Wollongong area on the 22 February 2022, 27th June 2022 and the 9th February 2023.

1.3 Purpose of this Report

The purpose of this Annual Review is to provide the DPE with a report of the site's environmental performance over the last year, actions taken in relation to environmental control and compliance with Development Consent Project Approval MP11_0094, and two modifications to this consent (MP11_0094 MOD 1 and MP11_0094 MOD 2). Condition 5 of Schedule 5 of the Project Approval outlines the requirement for WCC to prepare an annual report.

Table 1.1 outlines the content included in this report to address the requirements of Condition 5 of Schedule 5 of the Project Approval.

Table1.1 Condition 5 of Schedule 5 Requirements and Annual Review section.

Condition	Requirement	Annual Review Section/Response
5	One year after the commencement of operation, and annually thereafter, the Proponent shall review the environmental performance to the satisfaction of the Director-General. This review must:	This document has been prepared in response to the requirements of Schedule 5, Condition 5. The report covers the reporting period between the 2nd March 2022 to 1st March 2023.
(a)	Describe the operations that were carried out in the past year;	See Section 2
(b)	Analyse the monitoring results and complaints records over the past year, which includes a comparison of these results against the: • Relevant statutory requirements, limits or performance measures/criteria • Monitoring results of the previous years • Relevant predictions in the Environmental Assessment	See Section 3 for monitoring results, analysis and comparison against relevant criteria. See Section 4 for complaints results, analysis and comparison against relevant criteria.

Condition	Requirement	Annual Review Section/Response
(c)	Identify any non-compliance over the last year and describe what actions were (or are being) taken to ensure compliance;	See Section 5.
(d)	Identify any trends in the monitoring data over the life of the project;	See Section 3 for environmental components. See Section 4 for complaints.
(e)	Describe what actions will be implemented over the next year to improve the environmental performance of the project (including a timeline for completion of each action); and	See Section 5.
(f)	Be placed on Council's website within 2 weeks of completion.	This Report will be submitted to the Department of Planning and will be made available to the public via WCC's website.

1.4 Consideration of Compliance

1.4.1 Assessment of Compliance

Consideration of site compliance with the Project Approval and modifications is provided in this document. Consideration of site compliance with the Landfill and Construction Environmental Plans and associated subplans is also discussed in this document. Cumulative actions during this reporting period were measured against the last Independent Environmental Audit (November 2020) Results to measure progress. This Annual Environmental Management Review identifies the relevant environmental monitoring environment requirements as identified in the Approval, EPL licence, Sydney Water Trade Waste Agreement and management programs and plans. A discussion of requirements and results is provided in Section 3.

The compliance status of each requirement or commitment was determined according to the definitions in the Compliance Reporting: *Post Approval Requirements (DPIE-May 2020).* A summary of non-compliances for the reviewed conditions are provided in Section 5.

1.4.2 Non-compliance

37 non-compliances were recorded during this reporting period. These were reported in accordance with DPE and EPA requirements. 26 were related to stormwater overflow, 7 to surface gas emissions, 3 to leachate overflows and one small fire at the tip face.

Again in this reporting period, consistent heavy rainfall (almost 2500 mm) fell throughout and was responsible for all but one of the non-compliances recorded. The table below lists the Natural Disaster Declarations that were in place during this time.

AGRN 1049	Severe Storm	9 February 2023
AGRN 1025	Severe Weather & Flooding	27 June 2022 onwards
AGRN 1012	Severe Weather & Flooding	22 February 2022 onwards

The Pollution Incident Response Management Plan (PIRMP) was activated in a timely manner and mitigation measures were put in place in accordance with the approved management plans. These non-compliances will be discussed in the following sections.

2 General Facility Operations

During the reporting period 2022-2023, the facility operated as per '*normal',* in accordance with EPL 5862 and Project Approval No. 11_ 0094. The operating hours were Monday – Friday 0730 to 1630, and Saturday, Sunday and public holidays (0800 to 1600). Details pertaining to the waste streams and volumes received are provided in Section 6.

The Facility continued to operate throughout this reporting period of catastrophic storms and flooding. This proved challenging at times, however operations managed to continue safely during this period. Unfortunately, the nature of Waste Services meant that the site was unable to close even when access was difficult, and staff were under pressure. However, work continued in accordance with Operating Guidelines.

The different areas of operations undertaken in this reporting period are outlined below:

- Weighbridge and gatehouse
- Community Recycling Centre
- Small Vehicle Transfer Station
- Continued Filling of cell 1B with waste
- Leachate and stormwater management and associated monitoring
- Monitoring Areas – landfill gas, groundwater, noise and air quality
- Green Waste Transfer Area
- Landfill gas flare
- Further Installation of landfill gas collection infrastructure
- Stockpiling areas
- Environmental controls
- Weed Control and Revegetation works
- Weather Monitoring (MHL)

During this reporting period, the filling of Cell 1B continued despite the wet weather challenges. In parallel, gas infrastructure was expanded within the new fill areas and connected to the existing landfill gas flare system.

Upgrades to the leachate management system were undertaken (including installation of additional aeration capacity, leachate transfer pump system and update of process, control and dosing systems); as well as Stage 2 Works for Stormwater Pond Desilting, tendering for construction of the Rapid Fill Water Station and further odour improvement works completed in accordance EPL 5862.

Also, within this reporting period, Wollongong City Council continued rolling out their Food Organics Garden Organics (FOGO) Program in partnership with a local organics processing facility (Soilco). This has meant that 97% of residents now have access to the FOGO kerbside collection system, resulting in approximately 18 000 tonnes collected and diverted away from landfill.

Community support programs continued with the following activities undertaken within the reporting period:

- Household Chemical Collection
    - Three free events collected 64 500 tonnes of chemical and problem wastes.

- Garden Waste Collection
    - Five free events collected approximately 32 tonnes of garden waste for diversion to compost.
- Cardboard Collection
    - Three free events collected 44 tonnes for recycling.

A wide range of educational activities have been conducted throughout the past twelve months. These have included:

- Wollongong Summer Cleansing (focus on coffee cups)
- Operation Nappy workshops
- Household Chemical Collection, Garden Waste and Cardboard Waste Collection Events promotion
- Educational Pop-ups at events and shopping centres and at Botanic Gardens
- CALD Talks – TAFE English classes
- Home Composting workshops
- School Education events at the Botanic Gardens
- Waste App - Waste App continues to be updated with information for our residents to use to assist with kerbside collection and other recycling activities.
- Continued update of websites and printed information.
- Regular social media posts including campaigns for FOGO and for Recycling Week

3 Water Monitoring – Surface Water

Surface water (stormwater) monitoring was completed in order satisfy Approval No.11_ 0094 Schedule 4, conditions pertaining to 'Soil and Water'. The findings for the 2022-2023 reporting period are provided in the sections below.

3.1 Overview

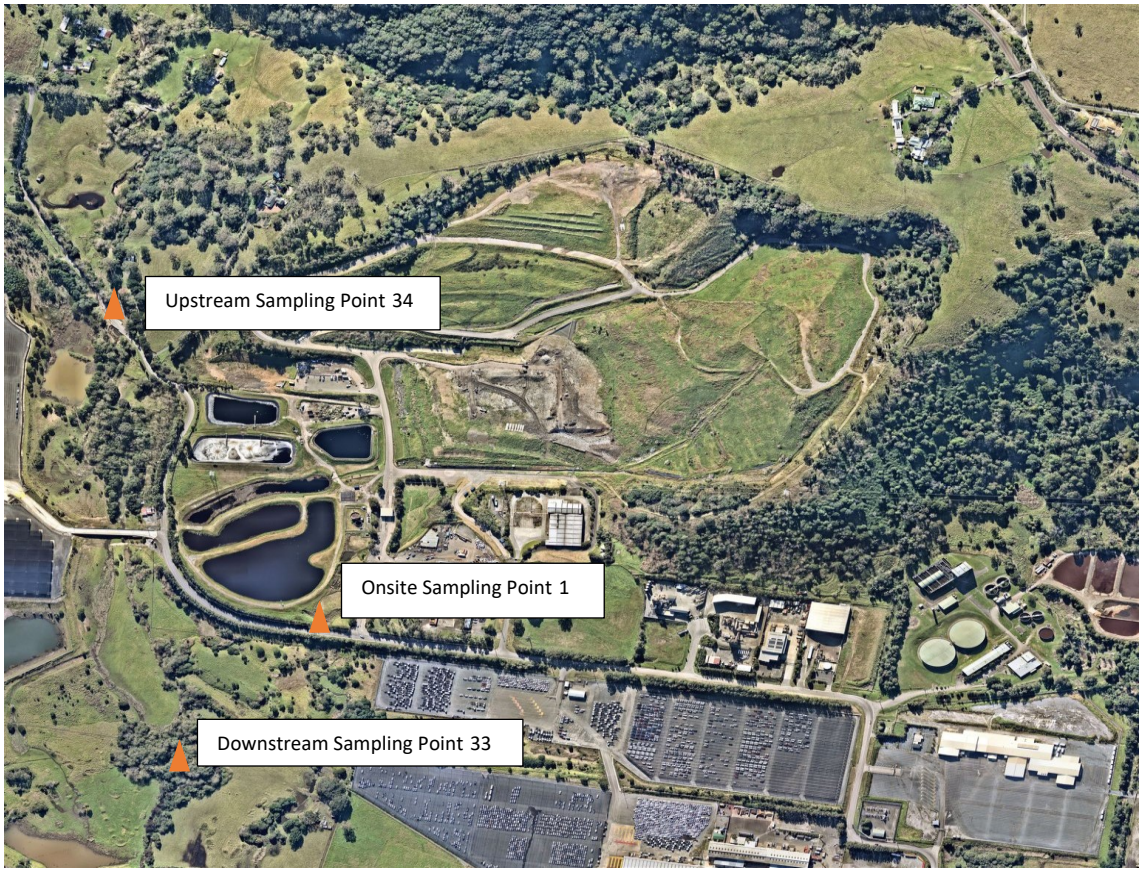
Surface water monitoring was undertaken by ALS Environmental, with the monitoring locations shown in Figure 3. A summary of the monitoring requirements are detailed in Table 3-1 below:

Table 3-1: Surface Water Monitoring

Activity	Description
Purpose	Detect excess sediment loads in stormwater leaving the site and/or potential cross contamination of stormwater with landfill leachate.
Frequency	**Surface Water Monitoring Points**: Quarterly or as required during breaches. **Polishing Pond**: During controlled release.
Location	Sampling locations were those listed in EPL 5862, and included the following: • Monitoring Point 1 – outlet at Reddalls Road (onsite) • Monitoring Point 33 – Downstream monitoring point; and • Monitoring Point 34 – Upstream Monitoring point The final 'Polishing Pond' is also monitored by Council during any controlled release event or overflow.
Methodology	Samples were collected using a 'scoop'; and Field parameters were recorded using a calibrated water quality meter.

	Table 3-2 : Surface Water Quality Parameters (Point 1, 33 and 34)		
	Annually		
Analytes/Field Parameters	Alkalinity	Calcium	Conductivity (EC)
	Filterable Iron	Magnesium	pH
	Sodium	Temperature	Total phenolics
	Ammonia	Chloride	Dissolved Oxygen
	Fluoride	Nitrate	Potassium
	Sulfate	Total Organic Carbon	Total Suspended Solids
	In addition, the 'Polishing Pond' was subject to analysis for pH and turbidity to ensure the water is suitable for release.		

Figure 3 Surface Water Sampling Locations



3.2 Performance Criteria

The performance criteria for surface water monitoring is detailed in the table below:

Table 3.2 Surface Water Performance Criteria

Description	Performance Criteria	Reference Document
Stormwater Discharge	No discharge of contaminated stormwater to water under dry weather conditions (*less than 10 mm of rainfall within a 24 hour period).*	EPL 5862
	No discharge of contaminated stormwater to water during a storm event of less than 1:10 year, 24 hour recurrence interval *(less than 297.4 mm of rain within 24 hours*).	
	pH: 6.5 – 8.5 Turbidity: 40 NTU	
Monitoring Point 1	pH: 6.5 to 8.5 TSS: 50 mg/L	Section 3 (I2) of EPL 5862

In addition to the above, Section 7.4 of the Draft LEMP (Golder 2020) states that all surface water results are to be assessed against the Australian and New Zealand and Australian State and Territory Governments (ANZAST) *Guidelines for Fresh & Marine Water Quality, 2018 (ANZAST 2018*).

Continued heavy rainfall (almost 2500 mm) resulted in extended delays in implementation of the EPA Stormwater Improvement Plan (U1). A variation was issued to address this during this reporting period, which states:

U1.3 By no later than 30th June 2023, the licensee must submit an independent assessment of the revised stormwater management system prepared by a suitably qualified and experienced independent person. The assessment must include recommendations for improvements to the management of the system to prevent overflow events and ensure compliance with relevant licence limits.

3.3 Results- Monitoring Points 1, 33 and 34

Surface water was monitored during various stormwater events and annually during this period. In total, there were 73 overflow events with 26 constituting non-compliances based on the license constraints for pH and TSS. Heavy rainfall events occurred almost continuously between March and October 2022, with almost 2500 ml falling during this period. Again, this reporting period was under the influence of the La Nina weather event, resulting in higher than average rainfall.

The full set of tabulated surface water results are provided in Appendix A, with a summary of the key results presented in the sections below.

3.3.1 pH and Total Suspended Solids (TSS)

During this period, pH levels at Point 1 fluctuated between 7.1 and 8.8 as the water column remained unstable from continual heavy rainfall (almost 2500 mm).

There were 6 non-compliant pH results ranging between 8.6 (7th, 9th, 11th July 2022) to 8.8 (6th & 8th July 2022), most likely influenced by the leachate overflows during the previous 5 months of continual heavy rainfall. There was one anomalous non-compliant result recorded on the 6th April (pH 8.7). Data results on either side of this date were compliant.

On 20 occasions at Point 1, TSS values were recorded over 50 mg/L. Values ranged between 52 – 330 mg/L and were related to the heavy rainfall events around each of the elevated values.

Upstream and downstream results were also heavily influenced by rainfall events in this reporting period.

At the end of March and beginning of April 2022, TSS results were highest at all three monitoring points for this reporting period. Downstream Point 33 had a recording of 524 mg/L TSS, Point 34 (upstream) recorded a level of 342 mg/L TSS and Point 1 recorded 330 mg/l TSS. These results correlate directly to the torrential rainfall event that occurred over the week.

pH upstream and downstream remained compliant during this reporting period.

Table 3.3 Surface Water Quality Monitoring Results

Site Name			(Point 1)	(Point 33)	(Point 34)
Sample Date	Chemical Name	Units			
02/03/2022	pH	pH	7.8	7.0	7.2
03/03/2022	pH	pH	7.8	7.3	7.8
04/03/2022	pH	pH	7.7	7.0	7.4
05/03/2022	pH	pH	7.6	7.2	7.5
06/03/2022	pH	pH	7.7	7.2	7.5
07/03/2022	pH	pH	7.8	7.1	7.4
08/03/2022	pH	pH	7.9	7.0	7.3
09/03/2022	pH	pH	7.8	7.2	7.4
10/03/2022	pH	pH	7.8	7.7	7.8
11/03/2022	pH	pH	7.8	7.3	7.7
12/03/2022	pH	pH	7.9	7.5	7.7
13/03/2022	pH	pH	7.9	7.5	7.8
29/03/2022	pH	pH	8.0	7.4	7.8
30/03/2022	pH	pH	8.1	7.5	7.8
31/03/2022	pH	pH	8.1	7.3	7.7
01/04/2022	pH	pH	8.0	7.4	7.4
02/04/2022	pH	pH	7.9	7.3	7.3
03/04/2022	pH	pH	7.9	7.3	7.5

04/04/2022	pH	pH	7.9	7.3	7.4
05/04/2022	pH	pH	7.4	7.2	7.5
06/04/2022	pH	pH	8.7	7.3	7.4
08/04/2022	pH	pH	8.2	7.0	7.3
09/04/2022	pH	pH	8.2	7.4	7.4
10/04/2022	pH	pH	8.4	7.3	7.5
11/04/2022	pH	pH	7.1	7.4	7.3
12/04/2022	pH	pH	7.9	7.3	7.4
13/04/2022	pH	pH	7.9	7.3	7.5
14/04/2022	pH	pH	8.0	7.2	7.3
19/04/2022	pH	pH	7.2	7.6	7.7
21/04/2022	pH	pH	8.4		
22/04/2022	pH	pH	8.1	7.5	7.6
26/04/2022	pH	pH	7.4	7.6	8.1
12/05/2022	pH	pH	8.3	7.3	7.3
24/05/2022	pH	pH	8.0	7.7	7.7
25/05/2022	pH	pH	8.2	7.8	7.7
26/05/2022	pH	pH	8.1	7.5	7.5
27/05/2022	pH	pH	8.0	7.3	7.6
30/05/2022	pH	pH	8.4	7.5	7.4
31/05/2022	pH	pH	8.3	7.5	7.6
01/06/2022	pH	pH	8.2	7.4	7.5
02/06/2022	pH	pH	8.3	7.4	7.6
03/06/2022	pH	pH	8.5	7.7	7.9
04/07/2022	pH	pH	7.8	7.4	7.0
05/07/2022	pH	pH	8.1	7.4	7.5
06/07/2022	pH	pH	8.8	7.7	7.8
07/07/2022	pH	pH	8.6	7.5	7.6
08/07/2022	pH	pH	8.8	7.6	7.8
09/07/2022	pH	pH	8.6	7.7	7.8
10/07/2022	pH	pH	8.5	7.4	7.8
11/07/2022	pH	pH	8.6	7.8	7.9
12/07/2022	pH	pH	8.4	7.4	7.5
13/07/2022	pH	pH	8.4	7.5	7.6
14/07/2022	pH	pH	8.5	7.8	7.8
15/07/2022	pH	pH	7.8	7.2	7.6
16/07/2022	pH	pH	8.1	7.8	7.7
26/07/2022	pH	pH	8.2	7.6	7.9
27/07/2022	pH	pH	8.3	7.6	7.8
28/07/2022	pH	pH	8.4	7.5	8.0
29/07/2022	pH	pH	8.0	7.6	8.0
09/08/2022	pH	pH	8.6	7.7	8.5
19/08/2022	pH	pH	7.4	7.7	8.1
05/10/2022	pH	pH	7.8	7.2	7.4

06/10/2022	pH	pH	8.0	7.6	7.3
07/10/2022	pH	pH	7.8	7.4	7.5
08/10/2022	pH	pH	7.8	7.2	7.5
09/10/2022	pH	pH	7.9	7.4	7.5
10/10/2022	pH	pH	8.0	6.9	7.4
12/10/2022	pH	pH	7.8	6.7	7.1
13/10/2022	pH	pH	7.7	7.1	7.4
24/10/2022	pH	pH	8.1	7.5	7.5
27/10/2022	pH	pH	8.0	7.0	7.3
11/11/2022	pH	pH	8.2	7.6	7.6
02/02/2023	pH	pH		7.0	7.5

Site Name			(Point 1)	(Point 33)	(Point 34)
Sample Date	Chemical Name	Units			
02/03/2022	Total suspended solids	mg/L	70	174	250
03/03/2022	Total suspended solids	mg/L	69	102	282
04/03/2022	Total suspended solids	mg/L	38	48	160
05/03/2022	Total suspended solids	mg/L	24	24	60
06/03/2022	Total suspended solids	mg/L	20	34	62
07/03/2022	Total suspended solids	mg/L	65	146	175
08/03/2022	Total suspended solids	mg/L	76	91	123
09/03/2022	Total suspended solids	mg/L	64	56	190
10/03/2022	Total suspended solids	mg/L	58	22	48
11/03/2022	Total suspended solids	mg/L	104	17	26
12/03/2022	Total suspended solids	mg/L	34	8	14
13/03/2022	Total suspended solids	mg/L	27	9	28
29/03/2022	Total suspended solids	mg/L	39	524	342
30/03/2022	Total suspended solids	mg/L	52	43	48
31/03/2022	Total suspended solids	mg/L	46	49	54
01/04/2022	Total suspended solids	mg/L	330	20	36
02/04/2022	Total suspended solids	mg/L	30	18	39
03/04/2022	Total suspended solids	mg/L	26	13	18
04/04/2022	Total suspended solids	mg/L	20	6	13
05/04/2022	Total suspended solids	mg/L	200	8	14
06/04/2022	Total suspended solids	mg/L	20	214	273
08/04/2022	Total suspended solids	mg/L	81	42	43
09/04/2022	Total suspended solids	mg/L	60	97	312
10/04/2022	Total suspended solids	mg/L	30	25	28
11/04/2022	Total suspended solids	mg/L	18	10	18
12/04/2022	Total suspended solids	mg/L	28	10	18
13/04/2022	Total suspended solids	mg/L	20	11	14
14/04/2022	Total suspended solids	mg/L	24	14	19
19/04/2022	Total suspended solids	mg/L	29	5	6

21/04/2022	Total suspended solids	mg/L	6		
22/04/2022	Total suspended solids	mg/L	49	6	<5
26/04/2022	Total suspended solids	mg/L	30	7	<5
12/05/2022	Total suspended solids	mg/L	11	42	43
24/05/2022	Total suspended solids	mg/L	72	9	14
25/05/2022	Total suspended solids	mg/L	28	57	18
26/05/2022	Total suspended solids	mg/L	46	18	12
27/05/2022	Total suspended solids	mg/L	52	10	14
30/05/2022	Total suspended solids	mg/L	24	8	8
31/05/2022	Total suspended solids	mg/L	16	8	8
01/06/2022	Total suspended solids	mg/L	14	<5	<5
02/06/2022	Total suspended solids	mg/L	14	5	<5
03/06/2022	Total suspended solids	mg/L	44	8	<5
14/06/2022	Total suspended solids	mg/L	68		
04/07/2022	Total suspended solids	mg/L	41	56	178
05/07/2022	Total suspended solids	mg/L	37	31	43
06/07/2022	Total suspended solids	mg/L	36	27	64
07/07/2022	Total suspended solids	mg/L	26	22	38
08/07/2022	Total suspended solids	mg/L	27	14	12
09/07/2022	Total suspended solids	mg/L	31	12	15
10/07/2022	Total suspended solids	mg/L	23	27	181
11/07/2022	Total suspended solids	mg/L	14	14	11
12/07/2022	Total suspended solids	mg/L	16	7	8
13/07/2022	Total suspended solids	mg/L	15	8	11
14/07/2022	Total suspended solids	mg/L	18	10	11
15/07/2022	Total suspended solids	mg/L	89	8	10
16/07/2022	Total suspended solids	mg/L	12	10	8
26/07/2022	Total suspended solids	mg/L	74	7	15
27/07/2022	Total suspended solids	mg/L	54	8	9
28/07/2022	Total suspended solids	mg/L	52	<5	<5
29/07/2022	Total suspended solids	mg/L	39	9	6
09/08/2022	Total suspended solids	mg/L	20	10	<5
19/08/2022	Total suspended solids	mg/L	26	<5	<5
05/10/2022	Total suspended solids	mg/L	10	10	7
06/10/2022	Total suspended solids	mg/L	35	487	294
07/10/2022	Total suspended solids	mg/L	72	33	30
08/10/2022	Total suspended solids	mg/L	48	19	24
09/10/2022	Total suspended solids	mg/L	42	85	75
10/10/2022	Total suspended solids	mg/L	39	28	26
12/10/2022	Total suspended solids	mg/L	9	<5	11
13/10/2022	Total suspended solids	mg/L	8	7	<5
24/10/2022	Total suspended solids	mg/L	13	105	394
27/10/2022	Total suspended solids	mg/L	33	16	19
11/11/2022	Total suspended solids	mg/L	9	8	<5

02/02/2023	Total suspended solids	mg/L		<5	<5

As mentioned in the beginning of this report, heavy rainfall episodes continued throughout the reporting period, as the La Nina weather pattern stayed over the Southern Hemisphere. This resulted in over 2300 mm falling at Whytes Gully and rainfall occurred every month. This provided a multitude of environmental management issues discussed in later sections of in this report.

Month	Rainfall over the Reporting Period
March 2022	670.6 mm
April 2022	216.8 mm
May 2022	188.8 mm
June 2022	1.8 mm
July 2022	550.6 mm
August 2022	24 mm
September 2022	121.6 mm
October 2022	272.2 mm
November 2022	44.4 mm
December 2022	47.8 mm
January 2023	122.6 mm
February 2023	119.4 mm
TOTAL	**2380.6 mm**

3.3.2 All Other Parameters

3.3.2.1 Nutrients and Total Organic Carbon (TOC)

No trigger values in ANZAST (2018) guidelines are specified for these compounds in fresh waters. The previous 2000 threshold level for nitrate (0.7 mg/L) is erroneous according to Australian and New Zealand Water Quality Guidelines and no current updated value is available for comparison.

Generally, increased nitrate concentrations correlated with the significant rainfall events at all Points (1, 33, 34). Point 1 had nitrate levels peaking at 4.86 mg/L on the 11th November 2022 and 4.6 mg/L on the 4th July 2022, with levels remaining below 1.54 mg/L for the rest of the reporting period. Point 33 (downstream) peaked on the 11th November 2022 as well at 2.39 mg/L, with Point 34 nitrate levels recording 0.61 mg/L as the highest level in this reporting period for upstream.

During most of the reporting period, nitrate levels remained below 0.5 mg/L. Upstream and downstream results were generally lower, however followed the similar peaking rates after rain events travelled through the upper and lower catchment.

Ammonia, which is a compound commonly associated with leachate, was reported at high concentrations (>0.9 mg/L) on 73 occasions in this reporting period, with the highest level recorded at 27.4 mg/L. These elevated values correlated directly with heavy rainfall events that resulted in leachate overflows onsite and the NSW Government declaring ongoing natural disasters in the Wollongong area.

Upstream (Point 34) ammonia levels remained compliant during this time (except for one reading of 1 mg/L), whilst downstream (Point 34) levels remained low with the highest recorded level at 1.87 mg/L.

TOC, which can be used as a general water quality indicator reported higher concentrations at Discharge Monitoring Point 1, with lower concentrations reported at both the Upstream and Downstream Monitoring Points (33 and 34). This may indicate a small influence at the sampling point which may be attributed to the facility, though this is not being carried through to the downstream sampling point. It also appears that higher concentrations were reported at the discharge point during the stormwater overflow events compared to the annual sampling event. This suggests a slight increase in discharge during the storm event, which is to be expected.

The highest level of TOC recorded at Point 1 was 47 mg/L on 8th and 13th July 2022. At Point 33 (downstream) 13 mg/L was the highest level recorded on the 6th October 2022 and the highest level recorded at Point 34 (upstream) was 10 mg/L on the 6th October 2022. These peak values and general trends follow the occurrence of heavy rainfall events.

In general, TOC and nutrient concentrations were lowest at the upstream sampling point (Monitoring Point 34). Concentrations increase at the discharge sampling point (Monitoring Point 1), then slightly decrease at the downstream sampling point (Monitoring Point 33), to concentrations similar to the upstream monitoring location. Again, this suggests that the discharge point is having some level of influence on surface water quality at this location.

3.3.2.2 Major Anions and Cations

No trigger values are specified in the ANZAST (2018) for anions and cations, but their inclusion allows for an understanding of water characteristics and whether these characteristics are changing between monitoring points.

Overall, concentrations of some anions and cations at Discharge Monitoring Point 1 were elevated after the continual rainfall throughout the reporting period. Chloride, fluoride, sodium, sulphate and alkalinity levels were all higher than at Point 33 (downstream) and Point 34 (upstream). However, calcium, magnesium and potassium remained at similar levels at all three sampling points.

3.3.2.3 Electrical Conductivity (EC)

No trigger values are specified in ANZAST (2018), though its inclusion allows for an understanding of water quality and possible impacts to this quality.

The measured EC varied across the three locations with increased spikes after and during rain events. The highest level was 1720 µS/L at Point 1 which occurred on the 19th August 2022 in the midst of continual heavy rainfall over 8 consecutive months. Point 33 (downstream) peaked at 630 µS/L on the 11th November 2022 and 566 µS/L was the highest recording at Point 34 (upstream) on the 2nd March 2023.

3.3.2.4 Filterable Iron

No trigger values are specified in the ANZAST (2018) for filterable iron.

At Point 1, the highest level of filterable iron detected was 4.18 mg/L on the 19th April 2022. Levels fluctuated greatly as a direct result of heavy rainfall flushing the stormwater system and sediments over 8 months of continual rainfall.

Low detectable concentrations were recorded both upstream and downstream (under 0.5 mg/L) throughout the reporting period.

3.3.2.5 Dissolved Oxygen (DO) and Temperature

Reported DO concentrations ranged between 0.24 mg/L (3rd June 2022) and 10.1 mg/L (11th and 12th April 2022) at Point 1. Ideally, DO levels should not drop below 3 mg/L to ensure a healthy water column (ANZAST (2018)). Values at Point 1 were under 3 mg/L in March and April 2022 on 10 occasions, which coincided with heavy rainfall that influenced other water quality parameters over this period (e.g. TSS levels).

Upstream and downstream waterways remained at healthy DO levels throughout the reporting period with temperatures fluctuating across all three monitoring points (9.1^0C – 26.7^0C).

3.3.2.6 Total Phenolics

Total phenolics (phenols) were reported below the laboratory practical quantification limits (PQLs) at all Monitoring points (1, 33 and 34) during all sampling events. No graph is provided for these parameters for this reason.

3.4 Results – Polishing Pond

The Polishing Pond is subjected to testing for pH and turbidity prior to, and during all controlled release events. Controlled release is undertaken to allow the stormwater management system to be maintained to increase storage of stormwater during rainfall events.

The polishing pond parameters (pH and turbidity) were measured only on two occasions, due to the continual catastrophic weather resulting in almost continual overflow. No controlled release was undertaken due to adverse conditions and non-compliant water quality (high pH and high turbidity).

3.5 Non-Conformances

In reference to surface water monitoring, the facility had 26 non-conformances during the 2022/23 reporting period.

3.6 Monitoring Trends

The graphed TSS and pH values for the last 5 years (2018-2023) are provided below, while the other analytes subject to monitoring during the same period are provided in Appendix A. A summary of the observable trends are provided below.

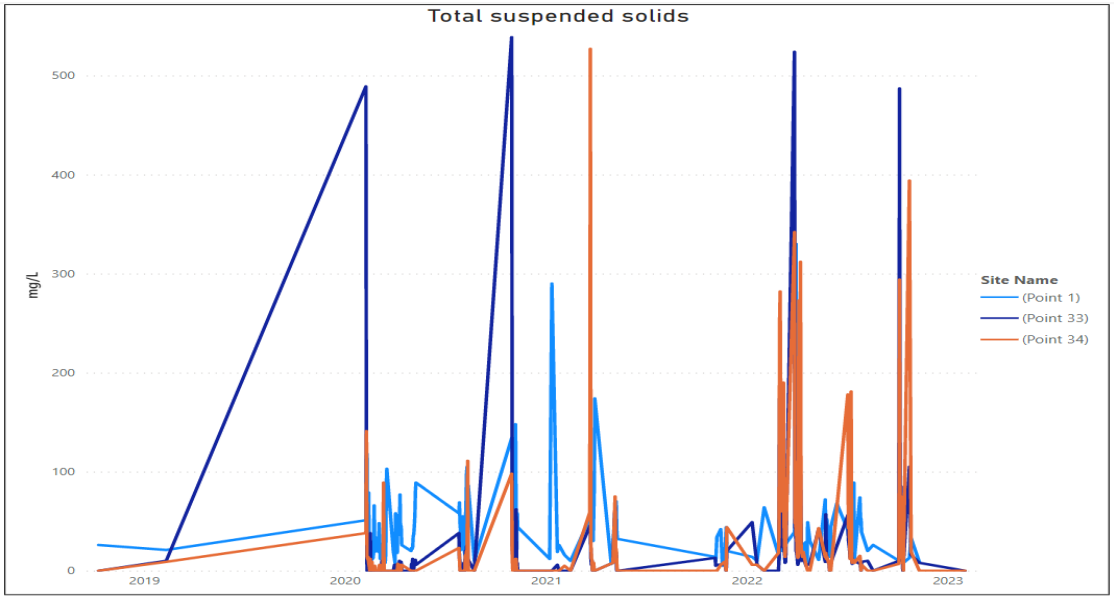
3.6.1 TSS Trends

As shown in the graph below, TSS concentrations have fluctuated greatly over the past two reporting periods. This coincides with the La Nina weather event in the Southern Hemisphere. As the weather improved, sediment loads decreased within acceptable limits.

This weather pattern has meant that controlled discharge was not able to be undertaken from the polishing pond due to almost continual overflow.

The overflow events that triggered the breaches during this period were directly related to severe storm events that affected the entire region, and therefore Council was not considered to be at fault by the EPA or DPE. During this reporting timeframe, infiltration of leachate into the stormwater management system occurred, however was quickly contained due to improved management practices which are discussed later in the report.

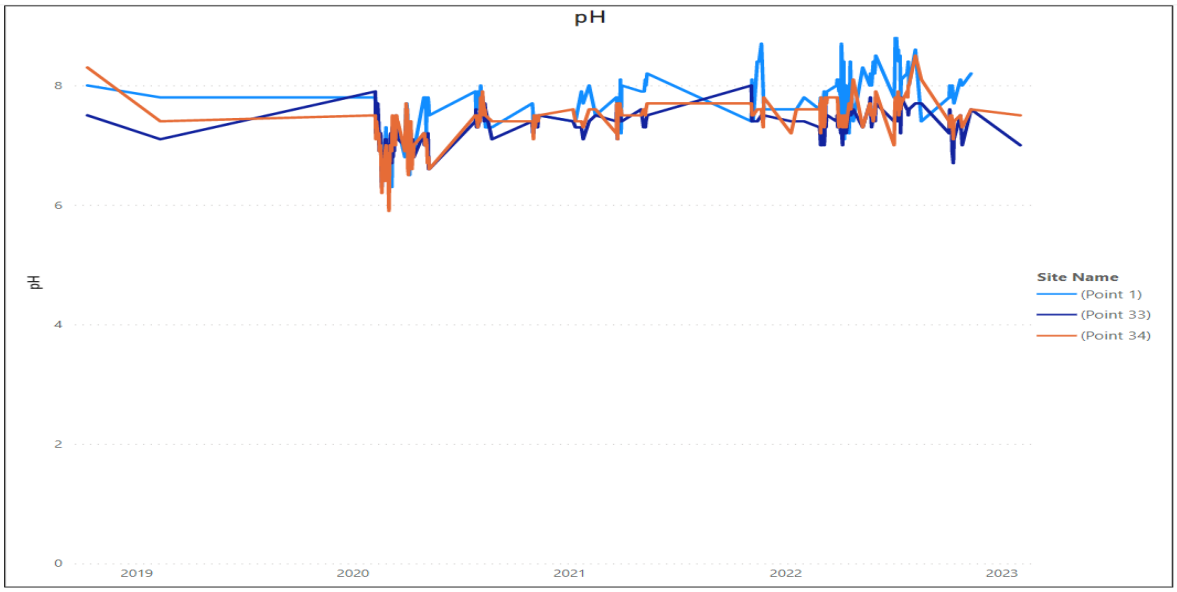
Graph 1: TSS Trends - Total Suspended Solids



3.6.2 pH Trends

As shown in the graph below, pH has been relatively stable and within range (6.5-8.5) for the life of the project. This trend did not continue as six breaches between 8.6 to 8.8 (attributable to continual torrential flooding events) occurred during this reporting period.

Graph 2: pH Trends



3.6.3 All Other Parameters

In relation to other parameters monitored, trend graphs are provided in Appendix A. Monitoring results fluctuated during this time (similar to the trends of the previous reporting period) most likely due to the large volume of water passing through the catchment over the last few years, mobilising contaminants and flushing them through the water column downstream.

Of interest, is the changing nature of the catchment. Until the last four years, the surrounding land use was predominantly rural residential land use. Whilst upstream remains relatively stable with limited to no development, adjacent land use has become predominantly light industrial (e.g. vehicle storage, bitumen plants, commercial composting) and now, increasingly residential.

This will undoubtably impact surrounding water quality, however it has been difficult to assess in this reporting period due to the heavy rainfall events.

3.7 EA Predictions

The EA did not provide predictions relating to surface water. However, Condition 5(d) of MP 11_0094 MOD2 instrument requires that this soil, water and leachate management plan is updated to incorporate the final detailed design specifications for stormwater management and collection at the site, including the stormwater upgrade drainage works. Also, within Schedule 3 of the Planning Approval, Council is required to prepare and implement a Soil, Water and Leachate Management Plan. This was submitted to DPE in November 2021 and was subsequently approved on the 29/06/2022.

The table below summarises the s75W Instrument of Modification Conditions (MOD2). The report approved is in accordance with Condition 3 in Schedule 5.

Table 3-5 Instrument of Modification (s75W)

Requirement	Condition Actions	Relevant Section
Site Water Balance	Identifies the source of water collected or stored on site, including rainfall, stormwater and groundwater. Includes details of all water use on site and any discharges. Describes the measures that will be implemented to minimize water use on site.	Whytes Gully Landfill Site Water Balance (GHD 2021).
Erosion and Sediment Control Plan	Is consistent with the requirements in the latest version of the Blue Book. Identifies the activities on site that could cause soil erosion and generate sediment. Describes the measures that will be implemented to minimise soil erosion and transport of sediment and stockpiles are managed.	Stockpile Management Plan (August 2021)
Leachate Management Plan	Includes final details of leachate management and collection on site. Includes a remedial action plan.	Whytes Gully Landfill - Leachate Management Systems Update (JPG Engineering 2023)
Stormwater Management Plan	Is consistent with the Wollongong DCP. Includes detailed design for the stormwater management and collection system. Demonstrates how the requirements of Condition 15 of the schedule has been addressed. Is updated to the satisfaction of the Secretary prior to the construction of works.	Whytes Gully: Soil, Water and Leachate Management Plan (2022)
An Ongoing Monitoring Program	Includes baseline data. A combined surface and groundwater monitoring program. Includes surface and groundwater impact assessment criteria.	Whytes Gully: Soil, Water and Leachate Management Plan (2022)

4 Water Monitoring- Groundwater

Groundwater monitoring was completed in order to satisfy Approval No. 11_0094 Schedule 4, conditions pertaining to 'Soil and Water'. The findings for the 2022 -2023 annual reporting period are provided in the sections below.

4.1 Overview

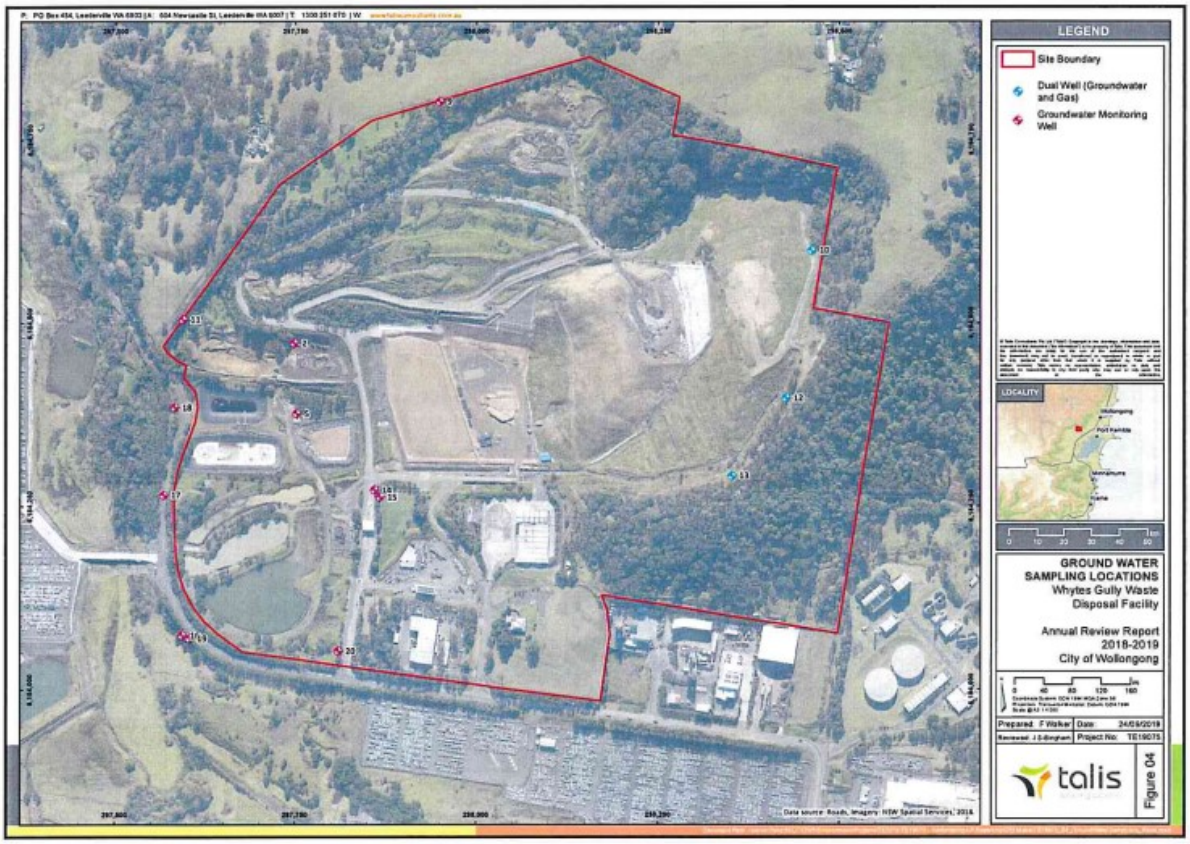
Groundwater monitoring was undertaken by ALS Environmental, with monitoring locations shown in Figure 4. A summary of the monitoring requirements are detailed below:

Table 4-1: Groundwater Monitoring

<table>
<tr><th>Activity</th><th colspan="2">Description</th></tr>
<tr><td>Purpose</td><td colspan="2">Detect if groundwater is impacted by leachate.</td></tr>
<tr><td>Frequency</td><td colspan="2">Quarterly in accordance with EPL 5862. Monitoring was completed in:
May 2022
August 2022
November 2022
February 2023</td></tr>
<tr><td>Locations</td><td colspan="2">Sampling locations were in accordance with EPL 5862, and included the following monitoring points: 5,9,10,11,12,13,14,15,16,17,18,19 and 20.</td></tr>
<tr><td>Methodology</td><td colspan="2">Prior to sampling, the sampling the standing water levels (SWLs) were measured using a water level meter;
Groundwater samples were collected using a bailer;
Field parameters were recorded using a calibrated water quality meter prior to sampling.</td></tr>
<tr><td rowspan="10">Analytes/Field Parameters</td><td colspan="2">The analysis schedule was in accordance with M2.3 of EPL 5862 and included:

Table 4-2: Groundwater Parameters</td></tr>
<tr><td>Annually</td><td>Quarterly</td></tr>
<tr><td>Metals: aluminium, arsenic, barium, cadmium, chromium (hexavalent and total), cobalt, copper, lead, manganese, mercury, zinc</td><td>Alkalinity</td></tr>
<tr><td>Benzene, toluene, ethylbenzene, xylene (BTEX)</td><td>Major anions and cations:
Calcium, magnesium, potassium, sodium, chloride, sulfate</td></tr>
<tr><td>Fluoride</td><td>pH and EC</td></tr>
<tr><td>Nitrate and nitrite</td><td>SWLs</td></tr>
<tr><td>Organochlorine and organophosphate (OC and OP pesticides)</td><td>Total dissolved solids (TDS)</td></tr>
<tr><td>Polycyclic aromatic hydrocarbons (PAH)</td><td>TOC</td></tr>
<tr><td>Total Petroleum Hydrocarbons (TRH)</td><td>Nitrogen – (ammonia)</td></tr>
<tr><td>Total phenolics</td><td></td></tr>
</table>

Figure 4: Groundwater sampling locations



4.2 Performance Criteria

Consistent with the surface water monitoring performance criteria, Section 7.4 of the LEMP (Draft Golder 2020) states that all groundwater results are to be assessed against the relevant ANZAST, 2018 Fresh Water (95%) guidelines and or other relevant trigger values specified in the document will be adopted during future monitoring events.

4.3 Results

4.3.1 Depth to Water Table

Groundwater flows in a south westerly direction through the site. The minimum and maximum recorded SWLs (metres below top of casing (m b ToC) were as follows:

Table 4-3: Standing Water Levels

Monitoring Event	Minimum Depth (m bToC)	Maximum Depth (m bToC)
23/02/2023	1.3 (Point 20)	10.42 (Point 12)
08/11/2022	1.08 (Point 20)	8.68(Point 12)
17/08/2022	1.12 (Point 20)	8.86 (Point 12)
18/05/2022	0.97 (Point 20)	7.92 (Point 12)
02/02/2022	1.72 (Point 15)	10.6 (Point 12)

4.3.1.1 pH and EC

Groundwater pH was reported to range between acidic (5.7 at Point 12 on the 2/02/2023) and neutral (7.7 on the 8/11/2022) for the reporting period.

Electrical Conductivity varied greatly across the site with the lowest value recorded being 107 µS/L at Point 12 (GMW105) on the 23/03/2022 and the highest value recorded being 5180 µS/L at Point 5 (GABHO2) also on 18/11/2022.

All bores being remained active across the site during this reporting period.

4.3.2 Laboratory Analysis Results

Tabulated analysis results for the 2022/23 annual reporting period are provided in Appendix B, with a summary of the results presented in the following sections.

4.3.2.1 Metals

Metals were detected in groundwater at all sampling locations, with concentrations of arsenic, barium, cadmium, chromium, lead, mercury and zinc below the ANZAST (2018) criteria for freshwater. However, the following exceedances were reported:

Table 4-4 Metals Exceedances

Metals	Monitoring Point	Exceedance (mg/L)	Assessment Criteria ANZAST (2018)
Aluminium	10 11 12 14 15 16 17 18 19 20	1.36 (2/02/2023) 5.19 (2/02/2023) 7.36 (2/02/2023) 0.43 (2/02/2023) 0.38 (2/02/2023) 0.88 (2/02/2023) 1.26(2/02/2023) 2.97 (2/02/2023) 0.06(2/02/20223) 0.47 (2/02/2023)	0.055
Cobalt	11 12 14 15 16 20	0.005 (2/02/2023) 0.003 (2/02/2023) 0.008 (2/02/2023) 0.004(2/02/2023) 0.022 (2/02/2023) 0.007 (2/02/2023)	0.0014
Manganese	16	4.32 (2/02/2023)	1.9

4.3.2.2 Hydrocarbons

Concentrations of BTEX, TRH, PAH and total phenolics were reported below the laboratory PQLs and below the adopted assessment criteria. Graphs of these values have not been included and the Results Table in Appendix B has shown them as a 0 value.

4.3.2.3 Major Anions and Cations

Concentrations of calcium, magnesium, potassium, chloride, fluoride, sulfate and sodium varied across the groundwater network. It does appear that groundwater is dominated by calcium, sodium and chloride ions, with all groundwater wells exhibiting concentrations of these ions compared to others.

Groundwater within the site is generally described as very hard to extremely hard. Monitoring Point 5 recorded the highest $CaCO_3$ concentrations during the reporting period, ranging between 907 mg/L (23/02/2023) to 1220mg/L (17/08/2022).

Monitoring Point 12 had the lowest concentrations ranging between 34 mg/L (17/08/2022) and 64 mg/L (2/03/2023).

4.3.2.4 Total Dissolved Solids (TDS)

Groundwater across the site was reported to be 'fresh' to 'brackish', with TDS concentrations ranging between 136 mg/L at Point 9 (8/11/2022) and 3130 mg/L at Monitoring Point 5 (17/08/2022).

Concentrations fluctuated significantly throughout the site and appear to be linked to the rainfall events during the reporting period. TDS levels were overall lower than the last reporting period, most likely due to dilution factors from the sheer volume of rainfall received at the site.

4.3.2.5 Total Organic Carbon (TOC)

No trigger values were adopted for TOC as none were available in the ANZAST (2018) guidelines. Concentrations across the site range from below the laboratory PQL (<1 mg/L) at bores 14 and 19 sampled on the 17/08/2022 and 2/02/2023 through to 73 mg/L (Point 16) on 17/08/2022.

4.3.2.6 OC and OP Pesticides

OC and OP pesticides were reported below the laboratory PQLs during the reporting period. It is noted however, that several PQLs were higher than the ANZAST (2018) guideline values, and as such some exceedances may be masked.

4.3.2.7 Nutrients

Nutrient concentrations including nitrate, nitrite and ammonia-N concentrations were reported below the adopted assessment criteria in almost all groundwater bores. However, there was an elevated level of 3.98 mg/L Nitrate at Monitoring Point 17 on the 2/02/2023.

Ammonia and nitrite levels remained low and fluctuated slightly during the reporting period.

4.4 Conformances

In relation to groundwater, the monitoring schedule was in conformance with during the 2022/23 reporting period. However, in relation to concentrations of contaminants of potential concern (COPs) in groundwater, the following non-conformances were noted:

- Raised OC/OP PQLs which may potentially mask exceedances in the adopted criteria.
- Continued metal exceedance (aluminium, cobalt and manganese) at several locations. However, based on previous monitoring data, it appears that aluminium and cobalt appear to be regionally elevated.

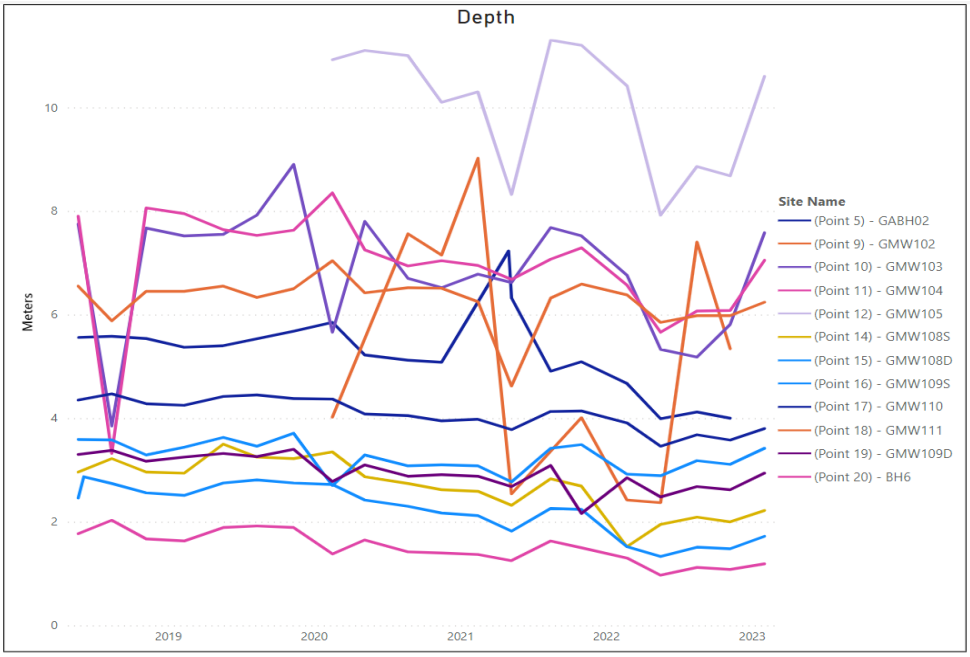
4.5 Monitoring Trends

The graphed monitoring trends for groundwater depth, TOC, ammonia-N and metals including aluminium, arsenic, copper, cadmium and zinc for the period 2018-2023 are provided below. The full suite of graphed trends are provided in Appendix B, with a summary of observable trends provided below.

4.5.1 Depth to Water Table

Water table levels remained elevated from previous years as heavy rainfall continued this reporting period. All bores continued to flow and were able to be measured.

Graph 3- Depth to Water Table



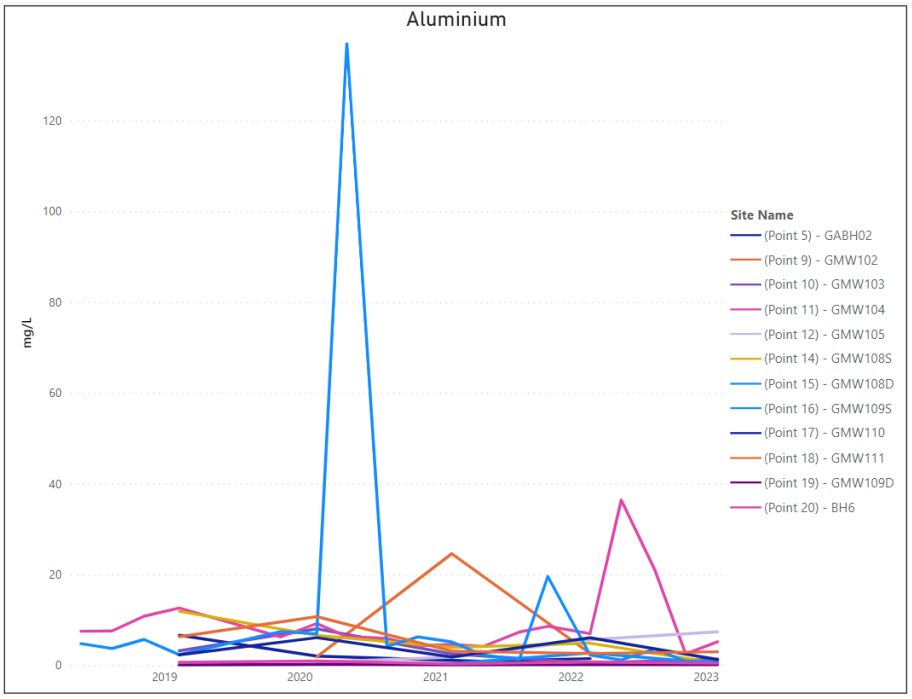
4.5.2 Metals

Aluminium

As shown in the graph below, aluminium concentrations continued to remain stable after peaking in 2020 (after a heavy rainfall event broke drought conditions). Continuing heavy rainfall again mobilised metals in the groundwater system, however concentrations remained low across the site.

However, aluminium levels still exceeded the adopted assessment criteria (0.055 mg/L).

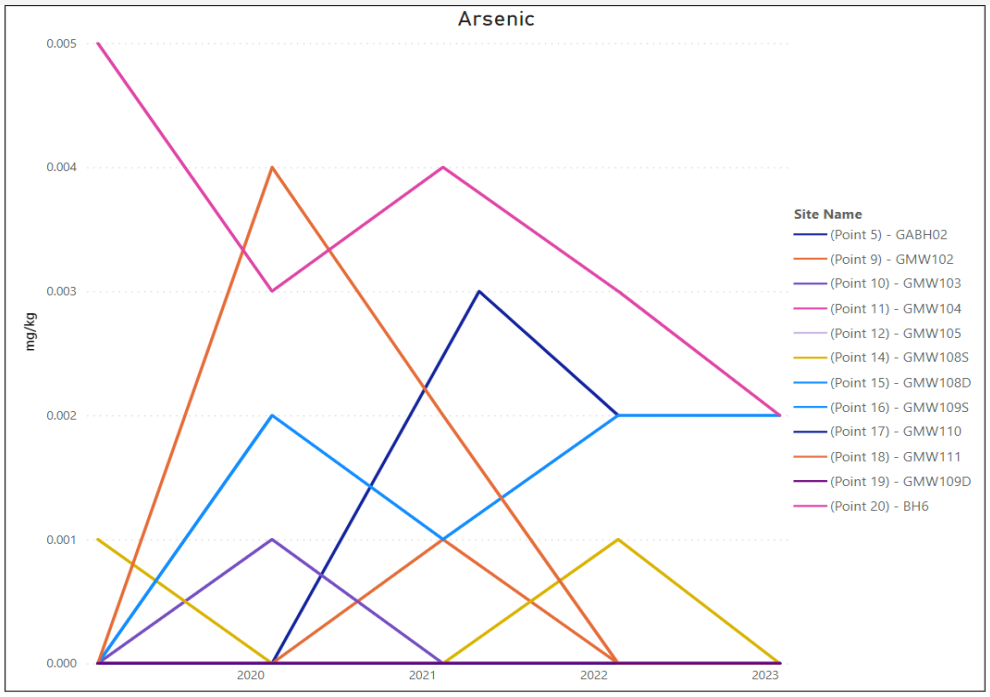
Graph 4 – Aluminium Trends



Arsenic

As shown in the following graph, arsenic concentrations have fluctuated over the period of the project but have generally stayed below the adopted guideline value of 0.013 mg/L. Even with increased levels peaking at Monitoring Points 5, 17 and 20 arsenic mobility in groundwater was below the guideline value.

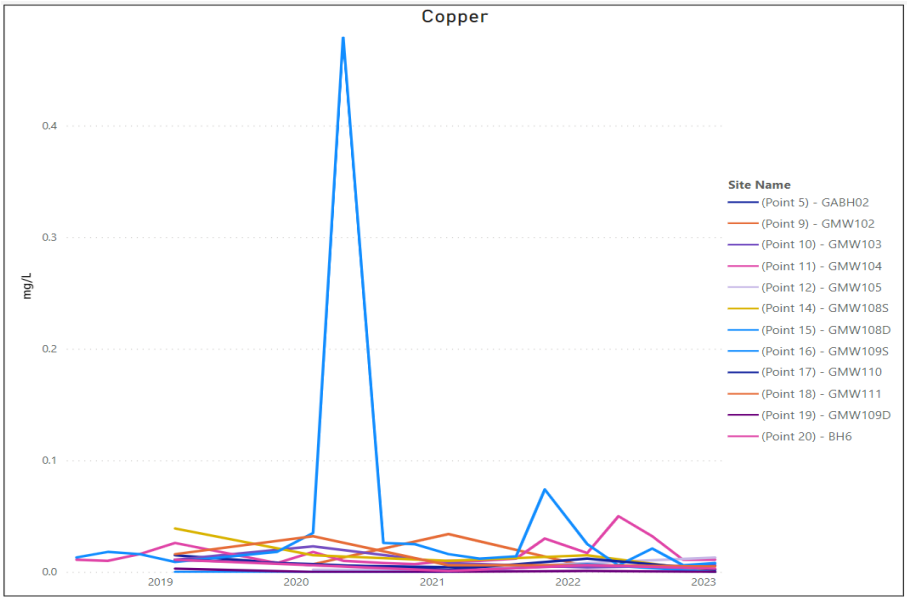
Graph 5: Arsenic Trends



Copper

As shown in the graph below, copper concentrations were below the adopted assessment criteria of 0.0014 mg/L this reporting period.

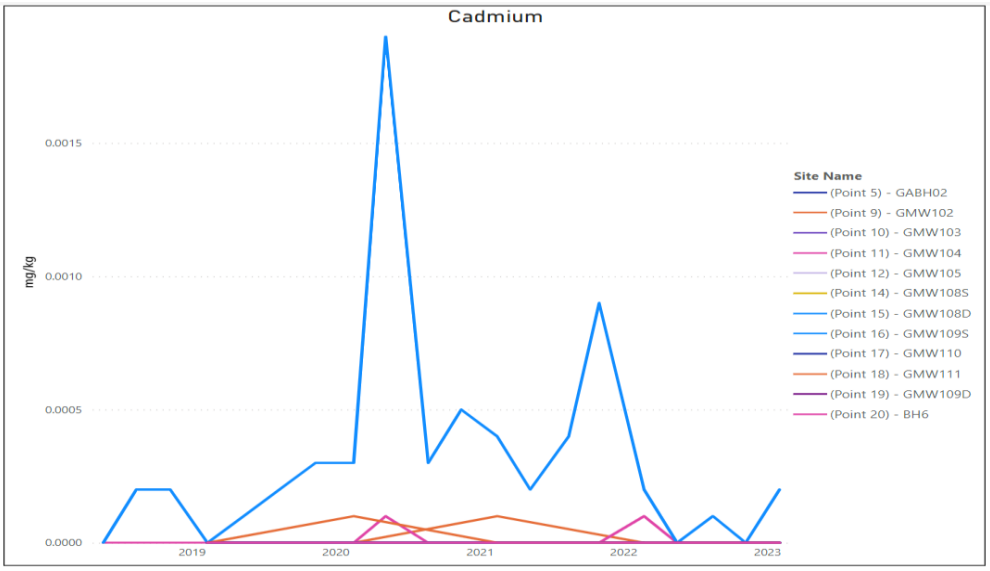
Graph 6: Copper Trends



Cadmium

The guideline values for cadmium were corrected to account for water hardness. As shown in the graph below, cadmium concentrations have been stable and below 0.002 mg/L this reporting period.

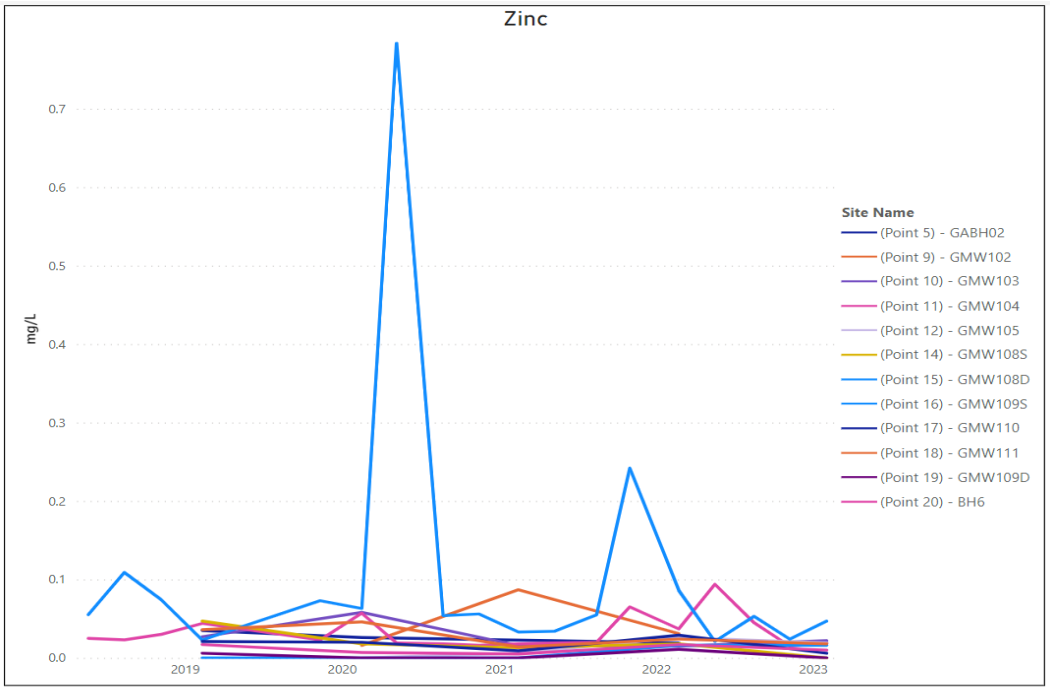
Graph 7 Cadmium Trends



Zinc

The monitoring values were corrected for hardness, with most results under the threshold value 0.0416 mg/L. The exceptions were Monitoring Points 11 and 16, which exceeded the guideline value on 2 occasions.

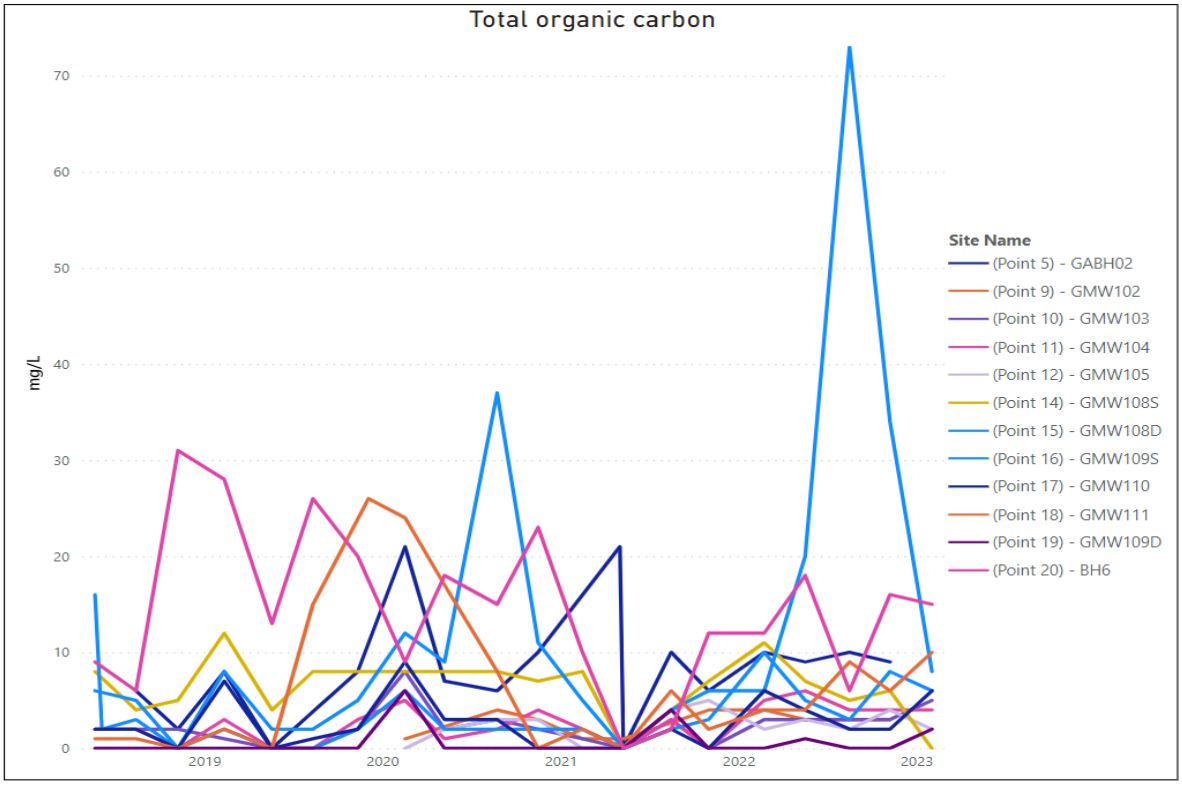
Graph 8 Zinc Trends



4.5.3 Total Organic Carbon (TOC)

As shown in the graph below, TOC concentrations have varied significantly over time with overall increases during this reporting period. This can most likely be attributed to continuing heavy rainfall events that have mobilised solutes within the groundwater system.

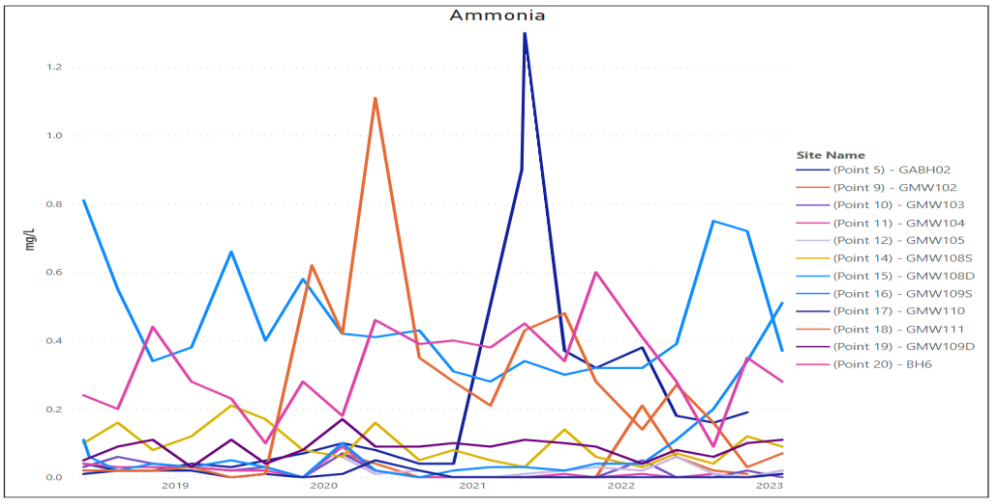
Graph 9 -TOC Trends



4.5.4 Ammonia-N

As shown in the graph below, ammonia-N was reported below the threshold level of 0.95 mg/L throughout the reporting period. With the groundwater network continuing to flow, ammonia levels have stabilised within the site.

Graph 10: Ammonia- N Trends



4.5.5 Other Analytes

The full suite of graphed trends for the same period are provided in Appendix B, with a summary of observable trends provided below. Concentrations have generally stabilised as the groundwater network continues to flow.

Major anions and cations, total dissolved solids, nutrients, pH and electrical conductivity were all heavily influenced by rainfall events during the 2022/23 period as solutes were mobilised in the water column.

OC and OP Pesticides, PAH, BTEX and Total Phenolic concentrations were all reported below the laboratory PQLs during all monitoring events.

4.6 EA Predictions

The EA predictions were that leachate migration into groundwater would be controlled via the permeability of the landfill liner. Additionally, no high value groundwater dependent ecosystems are located within the vicinity of the facility, and the landfill would present a relatively low risk if leachate did migrate into groundwater.

Based on the overall groundwater assessment, results have generally confirmed the EA predictions in the groundwater system underlying the facility. The latest Water Balance Analysis (GHD 2021) summarises groundwater characteristics as follows:

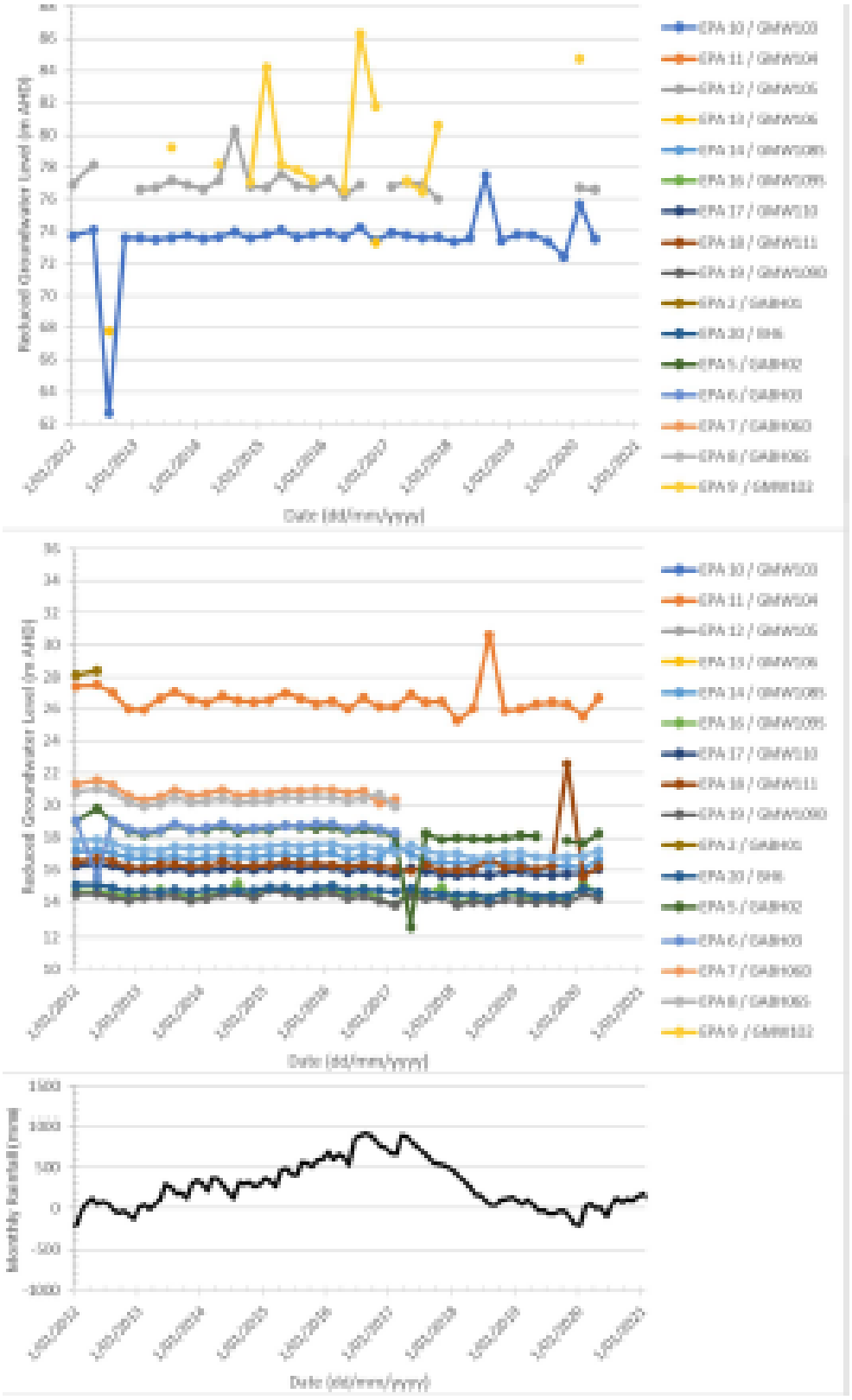
Water level measurements are taken quarterly from the landfill monitoring bores. The monitoring bore hydrographs are shown below and have been presented to characterise the seasonal groundwater response. The hydrographs have been presented over two reduced groundwater level ranges, as there is a considerable difference in elevation between the northern, elevated part of the site, and the flatter topographies to the south.

The water level monitoring data was received from Council and there are multiple monitoring anomalies, as water levels can change by over 6 m in some instances. In general terms, most monitoring bores show very limited seasonal fluctuation, i.e., generally less than 1 m variation.
A monthly residual mass curve of rainfall has been prepared to identify long term rainfall trends and has also been presented in the figure below. The rainfall data was sourced from Bellambi AWS climate station (68228) for the period 1990 to 2021, to characterise the influence of climate on groundwater levels. The absolute value of the residual mass curve is not significant; however the slope of the curve is:

– A positive slope indicates a wetter than average period
– A negative slope indicates a drier than average period
– A section of both negative and positive indicates a period of generally average rainfall
– The grade of the slope indicates how much wetter or drier than average the climate is

The residual mass curve indicates that the rainfall has been above average between 2013 and 2017, below average between 2017 and 2019, and relatively average since this period. In unconfined or water table aquifers, with relatively shallow water tables, increases in rainfall tend to result in a corresponding increase in groundwater levels. Such a response has not been obviously identified in the monitoring bore hydrographs. The relatively stable response in the hydrographs could be due to:
– Very low recharge rates in the bedrock aquifer
– In some parts of the site, groundwater levels in monitoring bores may be being artificially recharged by near site features e.g. leaking lagoons, stormwater channels or leaking buried services.

Figure 5 Monitoring Bore Hydrographs



5 Waste Monitoring – Trade Waste and Leachate

Sampling of trade wastewater and leachate was undertaken in order to satisfy Approval No. 11_0094 Schedule 4, conditions pertaining to 'Waste'. The findings for the 2022/2023 reporting period are provided in the sections below.

5.1 Overview

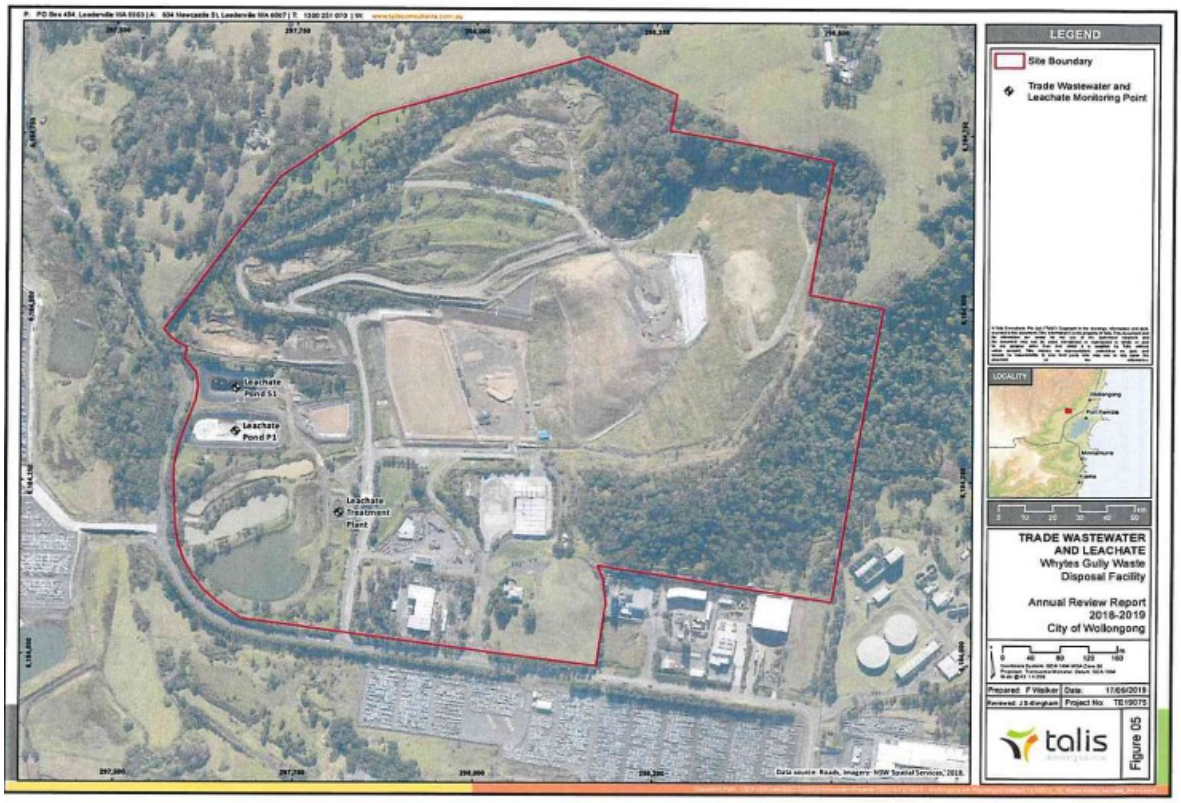
Trade wastewater and leachate sampling was undertaken by ALS Environmental in accordance with the *Consent to Discharge Industrial Trade Wastewater* (Sydney Water 2021). The monitoring locations are shown in Figure 5. A summary of the monitoring requirements is detailed in the table below.

Table 5-1: Trade Waste Monitoring Requirements

<table>
<tr><th>Activity</th><th>Description</th></tr>
<tr><td>Purpose</td><td>Trade Wastewater: Confirm quality of wastewater discharged from the facility.
Leachate: Chemically characterise the leachate to allow assessment of potential environmental harm and impacts.</td></tr>
<tr><td>Frequency</td><td>Trade Wastewater:
Monthly in accordance with EPL 5862. Monitoring was completed in:
On 13th March 2022 and every 22 days thereafter. If trade wastewater was not discharged on a scheduled day, then sampling was taken the next day when trade wastewater was discharged.
Leachate:
On 3 March 2022 and every week thereafter.</td></tr>
<tr><td>Locations</td><td>Sampling locations were in accordance with Sydney Water 2021, and included the Eastern Arm Collection Well, Balance Tank and Trade Wastewater (locations are depicted as Leachate Treatment Plant in Figure 5). In addition, sampling was also undertaken at Leachate Ponds P1 and S1.</td></tr>
<tr><td>Methodology</td><td>Trade Wastewater: Composite samples were collected over a 24 hour period using a composite autosampler, while grab samples were collected pre and post monitoring;
The composite samples were collected over one full production day by combining equal volumes taken over 30 minute intervals. The volumes collected were at least 5L over the full day; and
Readings of the flowmeter were obtained at the start and end of each sampling day.
Leachate: The ponds were sampled using a 'scoop' whereas the Balance Tank samples are directly collected from the tap, and the Eastern Arm Collection well is sampled using a bailer.</td></tr>
<tr><td>Analytes/Field Parameters</td><td>Samples were subject to laboratory analysis for the following:

Table 5-2: Trade Wastewater and Leachate Parameters
<table>
<tr><th colspan="2">Trade Wastewater</th><th>Leachate (CW-East, Balance Tank and Pond P1 and S1)</th></tr>
<tr><td>EC</td><td>Ammonia-N</td><td>TDS, TSS</td></tr>
<tr><td>Biological Oxygen Demand (BOD)</td><td>TSS</td><td>pH</td></tr>
<tr><td>TDS</td><td>EC</td><td>Ammonia-N</td></tr>
<tr><td>pH</td><td>Temperature</td><td>Temperature</td></tr>
<tr><td colspan="3">Discrete samples were tested for pH, EC and temperature using a calibrated water quality meter at the start and finish of each day.</td></tr>
</table></td></tr>
</table>

Figure 6: Wastewater and Leachate Sampling Locations



5.2 Performance Criteria

On the 17th December 2021, a trade waste agreement was signed that lowered the levels of some discharge parameters. This expired on the 17th December 2022, and guidelines proposed were lowered once more. Council is currently in negotiations with Sydney Water to maintain the same levels as per the previous agreement.

The current performance criteria for trade wastewater discharged from the facility to the sewer is provided in the table below:

Acceptance Standard	Performance Criteria	Guidance Document
Volume Discharged	605 kL/day	
Concentrations	Start and finish: pH 7-10 Ammonia – N: 100 mg/L TSS: 600 mg/L TDS: 10 000 mg/L Temperature: < 38^{0}C	

Maximum Daily Mass	Ammonia: 21 kg/day TSS: 120 kg/day TDS: 2500 kg/day BOD: 50 kg/day Ammonia: 100 mg/L TSS: 600 mg/L TDS: 10 000 mg/L	Sydney Water 2021

Section 4, Condition O7.2 of EPL 5862 states that the ' *licensee must maintain a leachate management system to collect and direct all leachate to a point for treatment and disposal to sewer'*. The leachate is treated at the facility and is discharged as Trade Wastewater.

The performance criteria for leachate contained at the facility is provided in the table below:

Acceptance Standard	Performance Criteria	Guidance Document
Leachate	No discharge of leachate to waters under dry weather conditions (<10 mm of rainfall in 24 hours) or stormwater events of less than 1:25 year, 24 hour recurrence interval (< 371.5 mm rainfall in 24 hours)	Section 3 L1.3 of EPL 5862

Note: Discharge of leachate from the pond caused by a 1:25 year, 24 hour recurrence interval storm event or greater does not constitute a breach of EPL 5862.

Consistent with the surface water monitoring performance criteria, Section 7.4 of the LEMP (Draft Golder 2020) for the facility states that all leachate results are to be assessed against the relevant water quality guidelines, specifically: ANZAST(2018) Freshwater (95%) guidelines.

5.3 Results

5.3.1 Trade Wastewater Discharged

The full tabulated trade wastewater results for the 2022-2023 reporting period are provided in Appendix C.

The volumes discharged and the analyte concentrations, including maximum daily mass and long-term average daily mass concentrations, were all reported below the trigger values specified in the performance criteria, with pH also reported within the recommended range. The maximum and minimum concentrations reported were as follows:

Table 5.3: Trade Waste Concentrations

Analyte	Minimum	Maximum	Performance Criteria
Volume Discharged	18/10/2022 175 kL	19/05/2022 312kL	605 kL/day
pH start	7	7.9	pH 7-10
pH finish	7.5	8.2	
Ammonia-N Concentrations	0.3 mg/L	62.8 mg/L	100 mg/L
Ammonia -N Maximum Daily Mass	0.06 kg	17.46 kg	Maximum Daily Mass: 21 kg/day Long Term Average:3.98 kg/day
TSS	6 mg/L	42 mg/L	600 mg/L
TDS	1490 mg/L	5100 mg/L	10 000mg/L
Temperature	12^{O} C	28^{0} C	< 38^{0} mg/L

5.4 Conformances

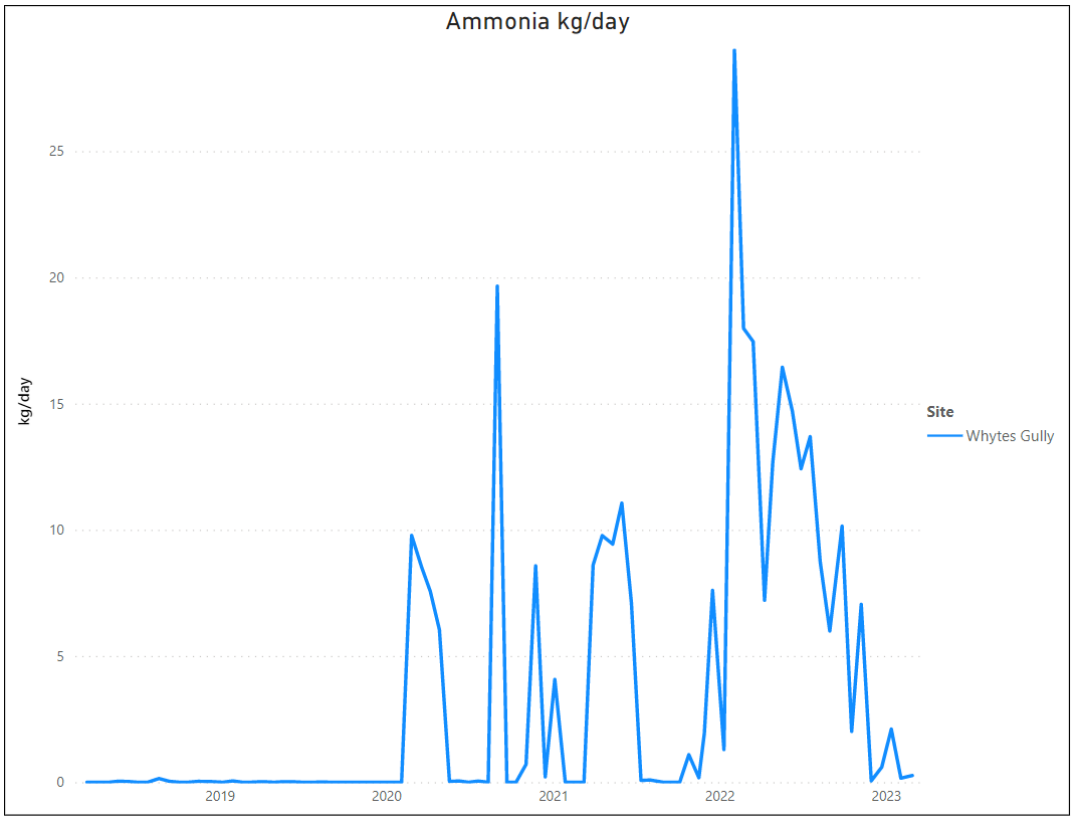
Based on the monitoring data over the reporting period, there were no breaches.

5.5 Monitoring Trends

5.5.1 Ammonia

Fluctuations continued to occur this reporting period due to the continual heavy rainfall and the performance criteria of 21.0 kg/day was not exceeded.

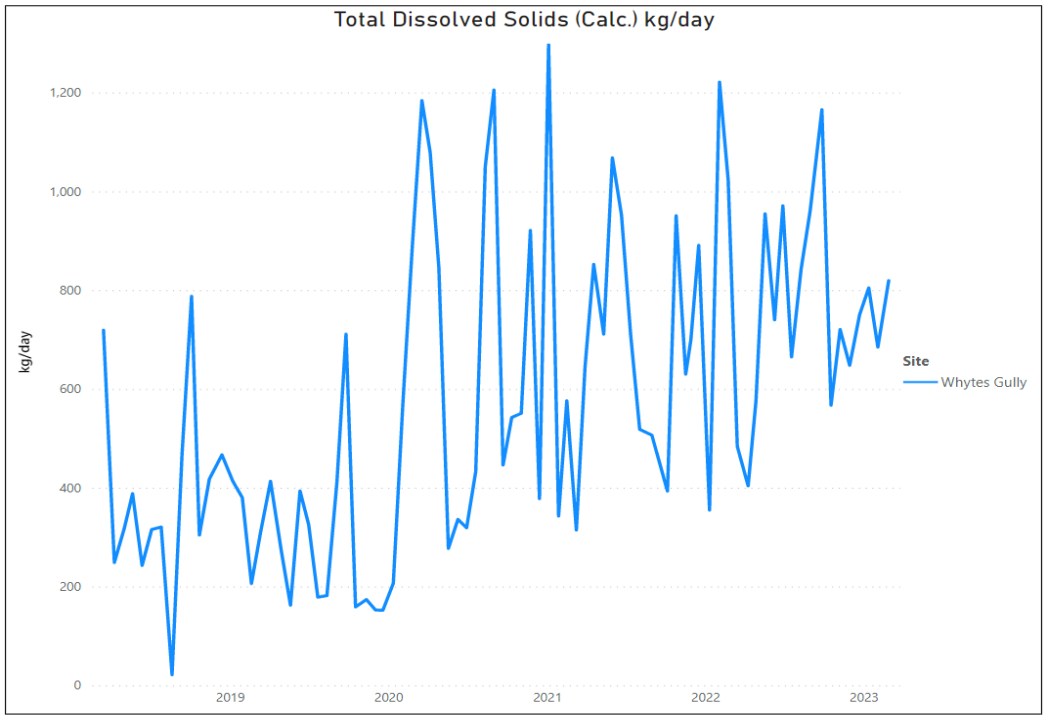
Graph 11: Ammonia Trends



5.5.2 TDS

As shown in the graph below, TDS concentrations have been subject to fluctuations influenced by rainfall events. Nonetheless, concentrations have been reported well below the performance criteria of 2500 kg/day over the life of the project (with exception of initial plant commissioning).

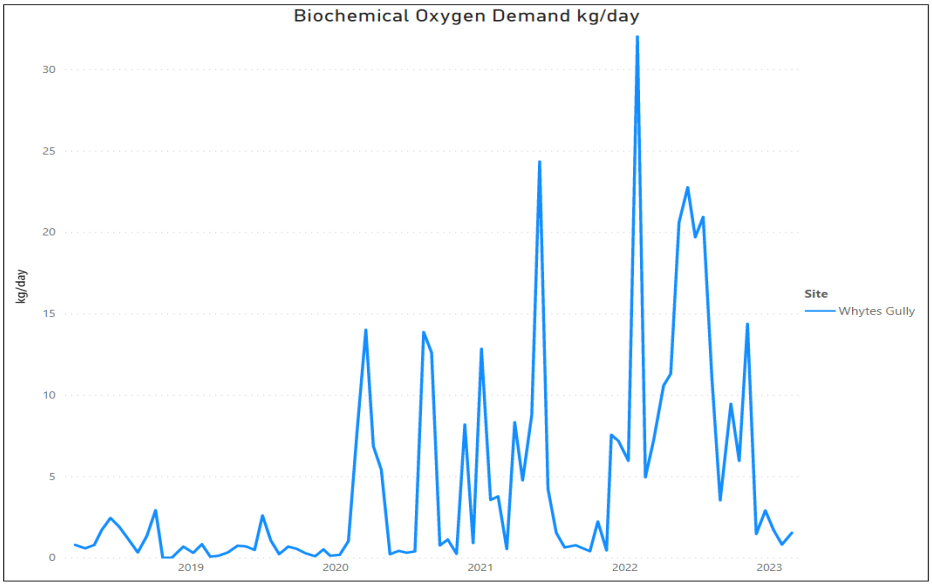
Graph 12: TDS Trends



5.5.3 Biological Oxygen Demand (BOD)

As shown in the graph below, BOD concentrations in trade wastewater have dropped in this reporting period. Heavy rainfall and continual flushing of the system has most likely contributed to this result, in conjunction with leachate system upgrades and improved management practices.

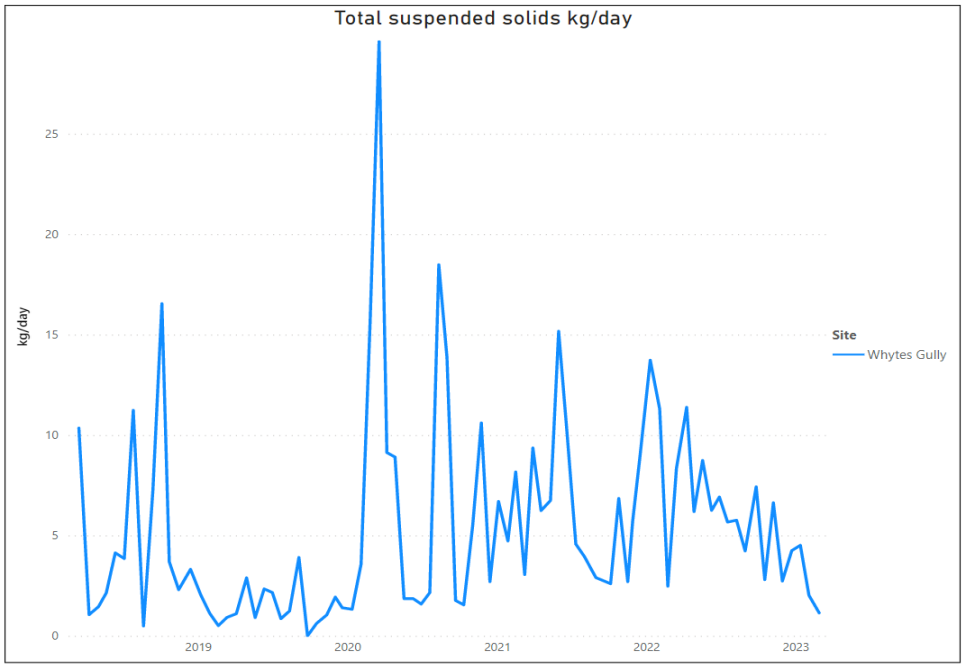
Graph 13: BOD Trends



5.5.4 TSS

As shown in the graph below, TSS concentrations in trade wastewater have been stable over the dry period like most parameters. However, the initial torrential rainfall event and subsequent follow up events, a number of individual exceedances occurred, however, when averaged over a 12 month period (as per Sydney Trade Waste Agreement 2021), these were under the agreed license requirements.

Graph 14: TSS Trends



5.6 EA Predictions

There were no EA predictions pertaining to trade wastewater discharged. This is primarily an agreement with Sydney Water based on wastewater quality and quantity discharged to sewer.

6 Waste- General

Waste screening and monitoring is required to satisfy Project Approval_No.11_0094 Schedule 4, conditions pertaining to 'Waste'. The findings for the 2022/23 reporting period are provided in the sections below.

6.1 Overview

Waste screening and monitoring was undertaken by Council for the 2022/23 reporting period in accordance with EPL 5862 and Project Approval No.11_0094. A summary of the requirements are detailed in the table below:

Table 6-1: Waste Screening

Activity	Description
Purpose	To ensure that the facility only accepts wastes that are authorised for receipt as per EPL 5862.
Frequency	**Random vehicle audits**: Daily **Screening of waste:** Continuous **Screening when truck tipping at the tip face or tipping at transfer station**: Continuous
Location	Weighbridge and transfer station tipping face.
Methodology	• Signs are present at the facility clearly stating the material accepted. The customer declares at the weighbridge the type of waste being disposed. Where the weighbridge operator is suspicious of the waste load, an inspection of the load is conducted. • Inspections via above load CCTV at the weighbridge. • Industrial loads require an application to be submitted with the waste loads- which is then reviewed by the weighbridge operator. • Visual inspection of small vehicle loads at the tipping face of the transfer station.

6.2 Performance Criteria

The performance criteria for waste received at the facility in the 2022/2023 reporting period is provided in the following table:

Table 6.2: Waste Received Criteria

Acceptance Standard	Performance Criteria	Guidance Document
Rejected Loads	Quantity of unacceptable waste types rejected.	Draft LEMP (Golder 2020)
	Number of detection reports of any waste rejected.	
	Number of incidences whereby unacceptable waste was discovered at the tipping face.	

	Monitoring data indicating consistent occurrences of unacceptable waste being detected.	
Tyres	No disposal of tyres <1.2 m in diameter.	EPL 5862
	No stockpiling of more than 50 tonnes at any one time.	
General solid waste (non-putrescible)	No more than 180 000 tonnes per annum.	Schedule 3, Condition 5 Project Approval No. 11_0094.
General solid waste (non-putrescible)		
Asbestos	*Not currently accepted at the facility.*	

6.3 Results

During the reporting period, only suitable waste streams were accepted at the facility, with an inbound total of 78 432 tonnes of material received. This is less than the maximum allowable performance criteria limit (180 000 tonnes per annum (tpa).

6.3.1 Rejected Loads

No rejected loads were recorded during this reporting period due to a technical error in the Mandalay Program data labelling.

6.3.2 Tyres

A total of 2260 tyres were received during the reporting period. The tyres are temporarily stored at the facility in accordance with EPL 5862, following which they were collected and taken offsite for recycling by Tyrecycle.

6.3.3 Other Inbound and Outbound Waste

Table 6-4: Inbound and Outbound Waste

Waste Stream Description	Inbound (tonnes)
Mixed Waste – Clean Up Australia Day	0.46
Dead Animals	13.88
General Waste	47 863.81
Commercial General Waste (inc. Council Waste)	30 568.45
Weighbridge Failure – Small Domestic Waste	-
TOTAL	**78 432.26**
Specific Items (tyres and mattresses)	7671 (items)
Recyclables (kerbside tyres and e-waste)	120.56

Waste Stream Description	Outbound (tonnes)
External Sources	2560.88

Outbound	5898.12
TOTAL	**8459.00**

1 Includes: computers/televisions, CRC, general recyclables, metal and motor oil.

2 Includes: clay, computer/televisions, gravel/aggregate, green waste, mattresses, 'other', rejected material, material from the revolve/recycle area, tyres and VENM.

6.4 Conformances

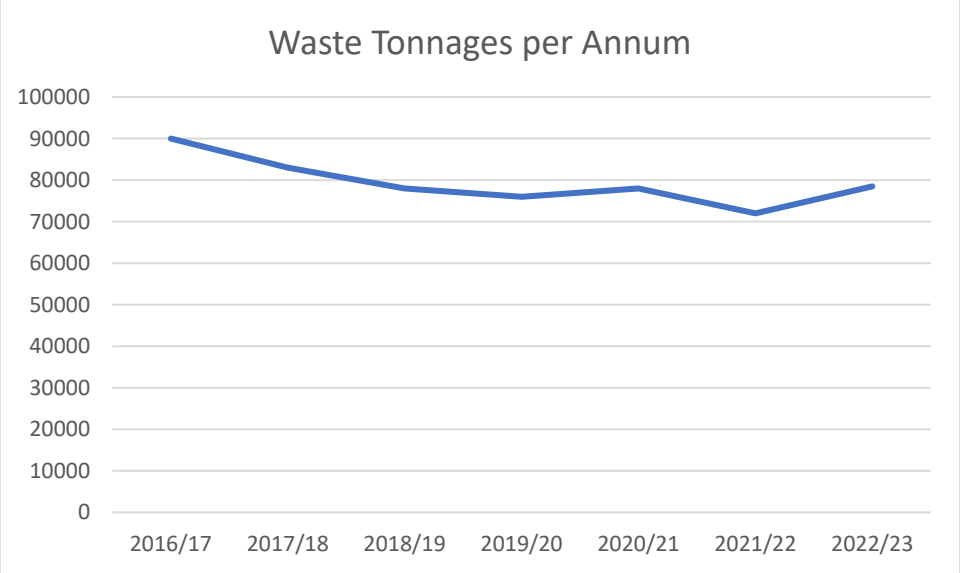
In relation to waste, the facility operated in conformance during the 2022/2023 reporting period.

6.5 Monitoring Trends

The total waste stream volumes received between

2013 and 2019 remained generally consistent. Looking at the volumes in the last reporting period, there appears to be a decreasing trend in the total waste stream amounts entering the facility.

The trend can be seen below.



6.6 EA Predictions

The EA predictions were made based on historical weighbridge records. In the EA predictions, it was reported that the waste volume received at the facility between the period 2008 and 2012 would range between approximately 120 000 -150 000 tpa.

It was predicted that the volume of waste accepted at the facility would not increase, and the waste stream volume for this reporting period was consistent with this EA prediction. Waste volumes

continue to decrease, resultant of more formal recycling programs, introduction of the organics program (FOGO) and overall diversion from landfill.

7 Air Quality Monitoring – Landfill Gases

Landfill gas monitoring was completed in order to satisfy Project Approval No. 11_0094 conditions in Schedule 4, pertaining to 'Air Quality'. The findings for the 2022/23 reporting are provided in the sections below.

7.1 Overview

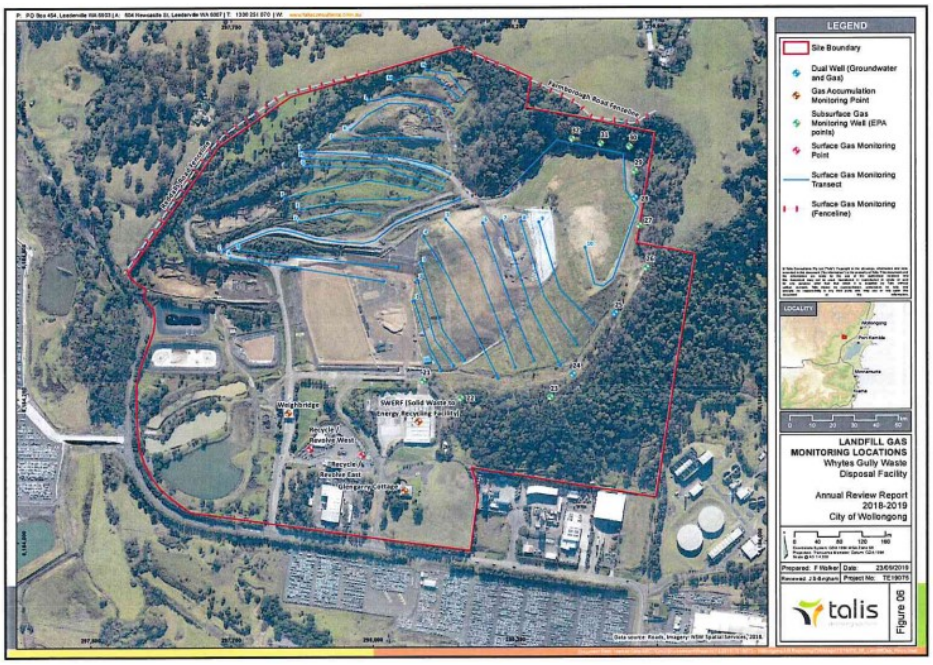
Surface gas, subsurface gas and gas accumulation into buildings, monitoring was undertaken by ALS Environmental in accordance with the *NSW EPA Environmental Guidelines: Solid waste landfills (second addition) 2016 (NSW EPA, 2016).* The monitoring locations are shown in Figure 6. A summary of the monitoring requirements for the facility are detailed in the table below:

Table 7-1: Air Quality Monitoring Requirements

Activity	Description
Purpose	Demonstrate that the cover material and extraction system is controlling the emissions of landfill gas.
Frequency	Monthly in accordance with EPL 5862.
Locations	• Transects 1-11[1] • Former landfill cell located to the north-west of the current active cell. Transects: A, C, D, E, F, G, H and I. • Recycle/Revolve East and West; and • Reddalls Road and Farmborough Road fence lines.
Methodology	Monitoring was undertaken using a calibrated *Inspectra Laser Gas Detector*. Methane concentrations were recorded at 5 cm above the ground surface in areas containing intermediate or final cover. The monitoring was undertaken at 25 metre spaced out transects on calm days, where wind speeds were <10 km/hour.
Subsurface Monitoring	
Purpose	Assess the presence of methane along the perimeter of the landfill cell and the potential for offsite migration.
Frequency	Monthly in accordance with EPL 5862.
Locations	12 landfill gas monitoring wells, including: EPA Point 21 (LFG MW1) to Point 32 (LFG MW12) in accordance with EPL 5862.
Methodology	Monitoring was undertaken using a calibrated *Inspectra Laser Gas Detector*.
Gas Accumulation	
Purpose	Demonstrate that methane along the perimeter of the landfill cell and the potential for offsite migration.
Frequency	Monthly in accordance with EPL 5862.

Locations	• Weighbridge • Glengarry Cottage (administrative building) • Recycling Transfer Station • Whytes Gully Operations Hub • Old SWERF/Visy site • Neighbouring properties within 250 m (these formally declined monitoring by WCC)
Methodology	Monitoring was undertaken using a calibrated *Inspectra Laser Gas Detector*.

Figure 6: Landfill Gas Monitoring Locations



7.2 Performance Criteria

The performance criteria adopted for the 2022/23 reporting period for landfill gases is provided in the table below:

Table 7-2: Landfill Gas Performance Criteria

Details	Corrective Action Criteria	Mandatory Reporting Requirement	Guidance Document
Surface Gas	Methane: 500 parts per million (ppm)	Yes	NSW EPA (2016)
Subsurface Gas	Methane: 1.0% volume/volume (v/v)	Yes	
	Carbon Dioxide: 1.5% v/v, above established background levels.	No	
Gas Accumulation	Methane :1% v/v	Yes	

7.3 Results

The landfill gas monitoring results for the 2022/23 reporting period are summarised in the following sections, with a copy of the full results provided in Appendix D.

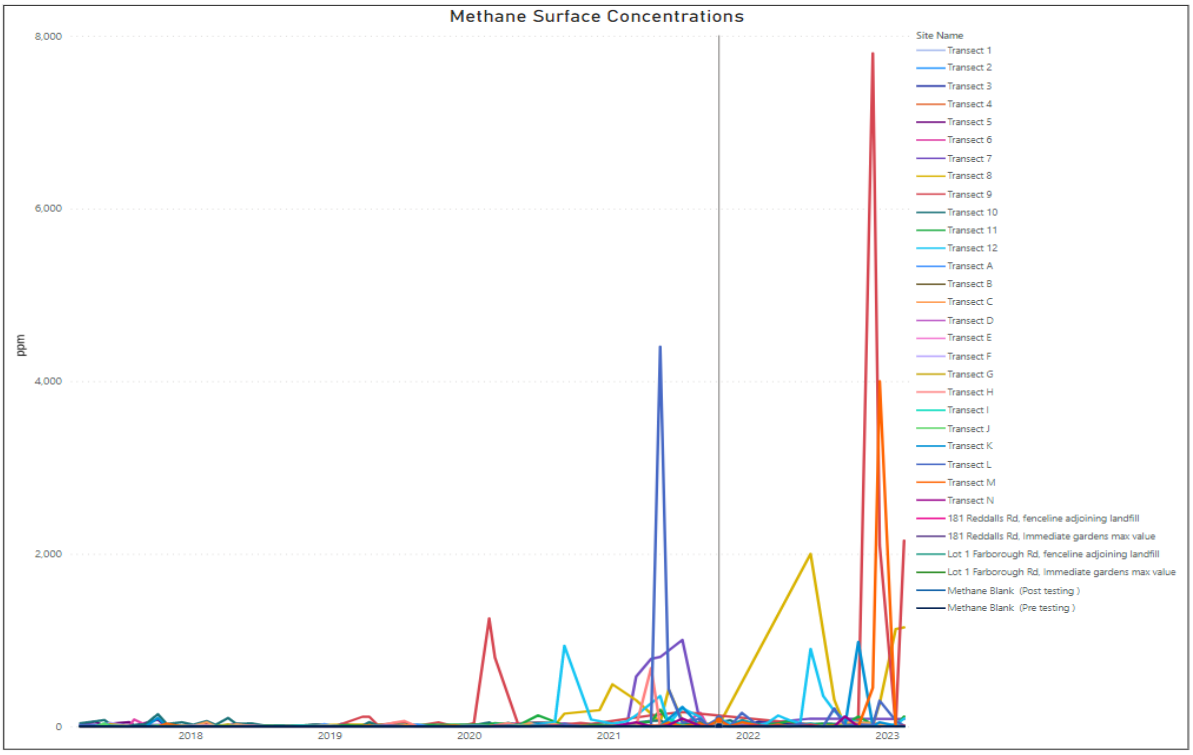
7.3.1 Surface Methane

Surface gas results were reported above 500 ppm on seven occasions within the reporting period. These were recorded as follows:

- Sample 12.5 (900 ppm) on 15/06/2022
- Sample 8.2 (2000 ppm) on 15/06/2022
- Sample K.4 (980 ppm) on 18/10/2022
- Sample 9.7 (7800 ppm) on 25/11/2022
- Sample 9.3 (1200 ppm) on 13/12/2022
- Sample 9.4 (2100 ppm) on 13/12/2022
- Sample M.4 (4000 ppm) on 13/12/2022

These correlated to heavy rainfall events received at the site in the days prior. These levels have been increasing as the site became saturated with the heavy rainfall conditions over the past three reporting periods. The transects with increased levels are located in the upper areas of the site.

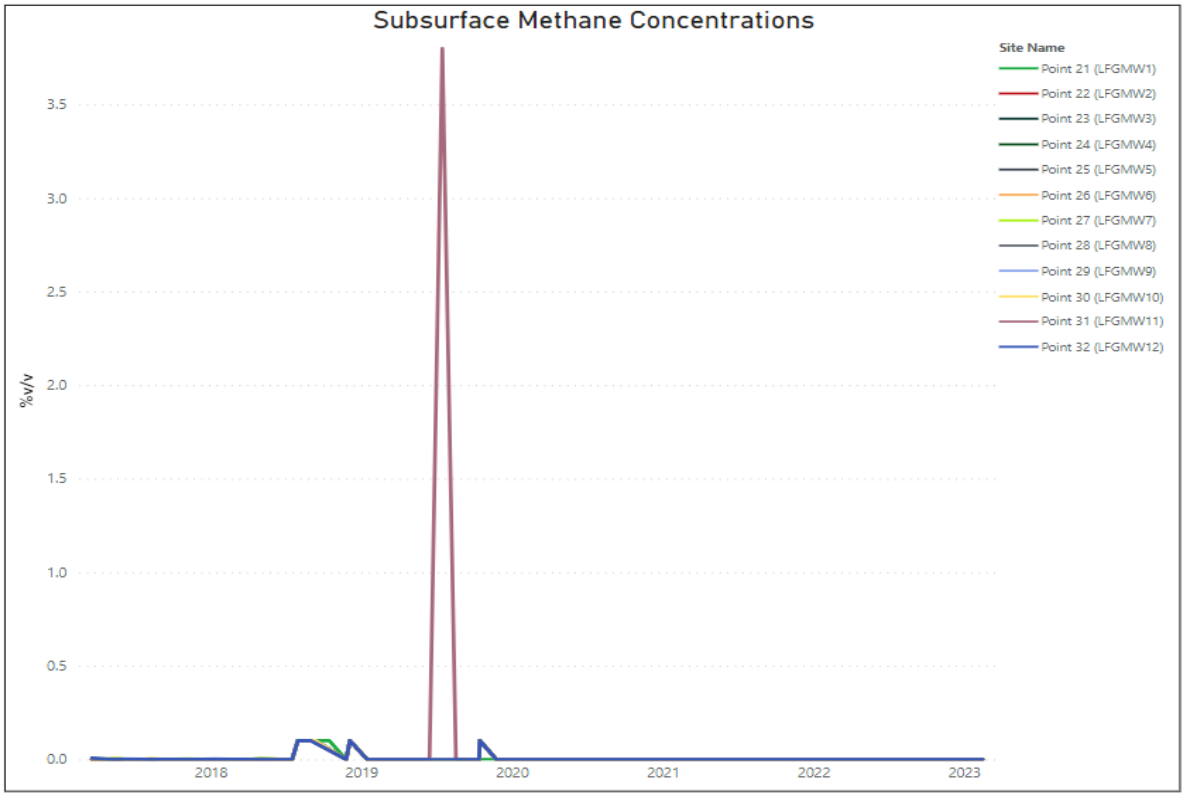
Graph 16: Methane Concentrations



7.3.1 Subsurface Methane

No subsurface gas results were recorded over 1.0 % vv. All readings were around 0 for the reporting period.

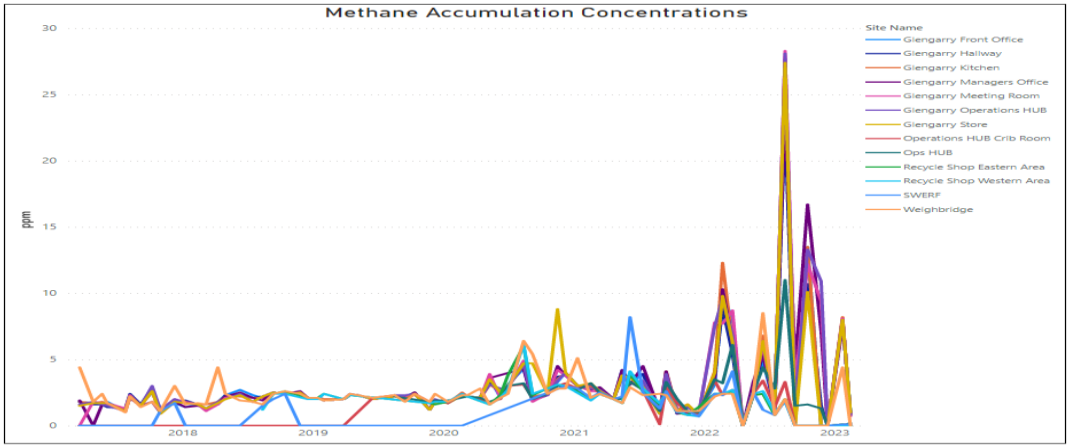
Graph 17: Subsurface Methane Concentrations



7.3.2 Gas Accumulation

As shown in the following graph, the methane concentrations accumulating into buildings have remained low even though there has been increased levels again over the last few reporting periods. Again, the higher levels correlate with heavy rainfall events.

Graph 18: Methane Accumulation Concentrations



7.3.3 EA Prediction

There were no predictions pertaining to concentrations of methane accumulating into buildings, subsurface and near surface emissions.

8 Air Quality Monitoring – Dust

Dust monitoring was completed in order to satisfy Approval No. 11_0094 conditions in Schedule 4, pertaining to 'Air Quality'. The findings for the 2022/23 reporting period are provided in the section below.

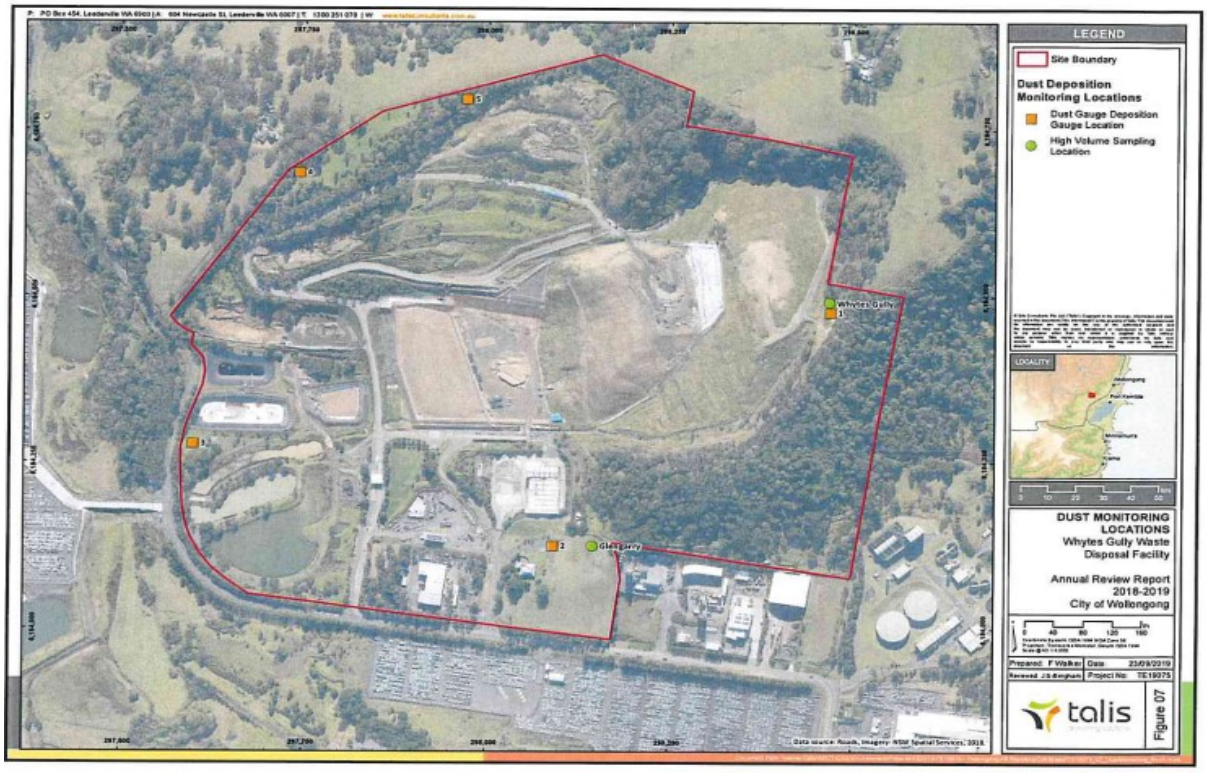
8.1 Overview

Dust monitoring was undertaken on a continuous basis using dust deposition gauges as detailed in the table below, with sampling location presented in Figure 7.

Table 8-1: Dust Monitoring Requirements

Activity	Description	
Purpose	Measure respirable dust due to sensitive receptors.	
Frequency	Continual basis with dust deposition gauges (DDG) collected and analysed monthly.	
Locations	A total of locations are monitored, including DDG1 – DDG5 which were placed around the perimeter which were placed around the perimeter of the facility, with high-vol samplers set up at two of these locations (DDG1 and DDG2 – Glengarry Cottage and Whytes Gully).	
Methodology	The dust deposition gauges were installed by ALS Environmental in accordance with *Australian Standard (AS) 3580.10.1:2003 Methods for analysis of ambient air, Method 10.1: Determination of particulate matter- deposited matter- gravimetric method (AS 3580.10.1:2003).* The gauges were placed around the perimeter of the facility's boundaries with bottles swapped out on a monthly basis. Once per month, respirable dust sampling (particulate (PM)) was undertaken at least two locations utilising a PM_{10} sampler.	
Analytes	The laboratory analysis was as follows: **Table 8-2 Dust Analysis Schedule**	
	Ash content (g/m^2/month and mg)	Total suspended particulates (TSP)
	Combustible matter (g/m^2/month and mg)	PM_{10}
	Total insoluble matter (g/m^2/month and mg)	

Figure 7: Dust Monitoring Locations



8.2 Performance Criteria

The dust monitoring performance criteria adopted for the facility is provided in the following table:

Table 8-3: Dust Criteria

Details	Averaging Period	Criteria	Guidance Document
Long-term for Particulate Matter			
TSP	Annual	90 µg/m^3	Approval No. 11_0094
PM_{10}	Annual	30 µg/m^3	
Short-term for Particulate Matter			
PM_{10}	24 hour	50 µg/m^3	Approval No. 11_0094
Long-term for Deposited Dust			
Deposited dust	Annual	Maximum increase in deposited dust level: 2 g/m^2/mon	Approval No. 11_0094
		Maximum total deposited dust level: 4 g/m^2/mon	

8.3 Results

The tabulated dust monitoring results are provided in Appendix F.

TSP and PM_{10} concentrations varied on a monthly basis across the monitoring period, however remained within compliance limits.

8.4 Conformances

The facility conformed to air quality criteria throughout this reporting period. An updated Air Quality Management Plan was approved by the EPA and DPE in the previous reporting period.

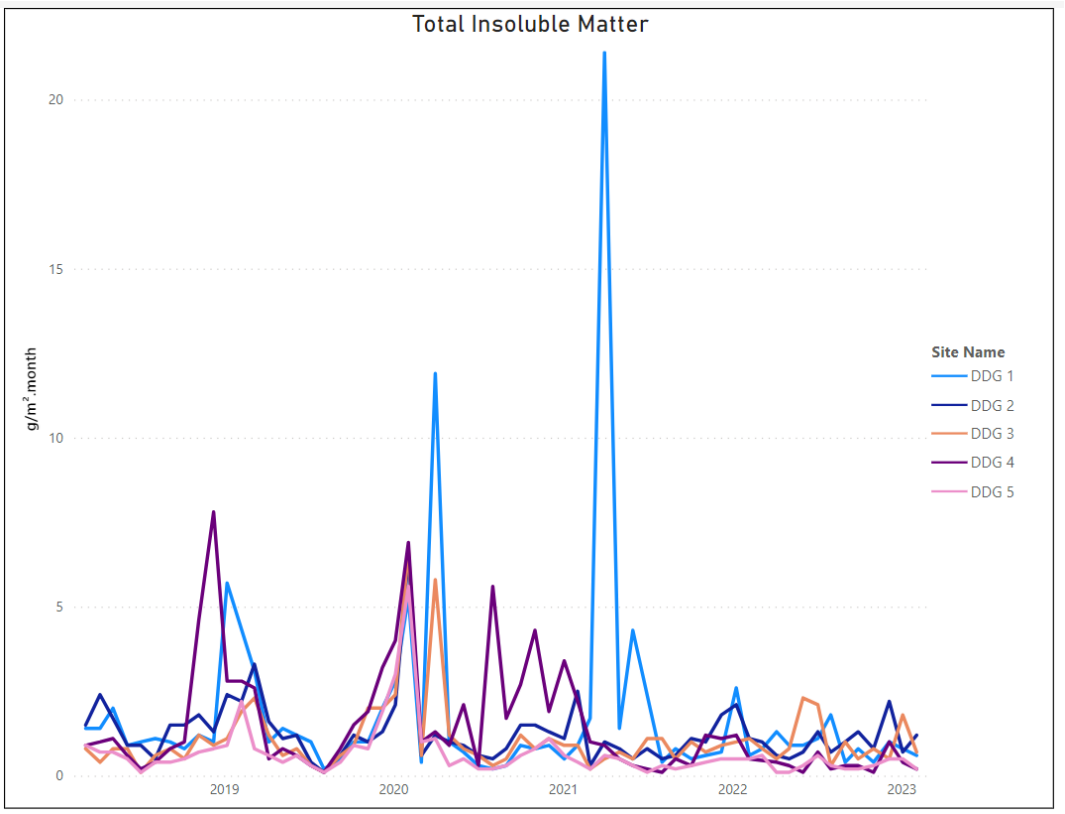
8.5 Monitoring Trends

The graphed monitoring trends measured at the Dust Deposition Gauges (DDGs) for the 2022/23 reporting period are provided below.

8.5.1 Total Insoluble Matter

As shown in the graph below, dust concentrations have been subject to fluctuations but were below the performance criteria (4 g/m^2/month).

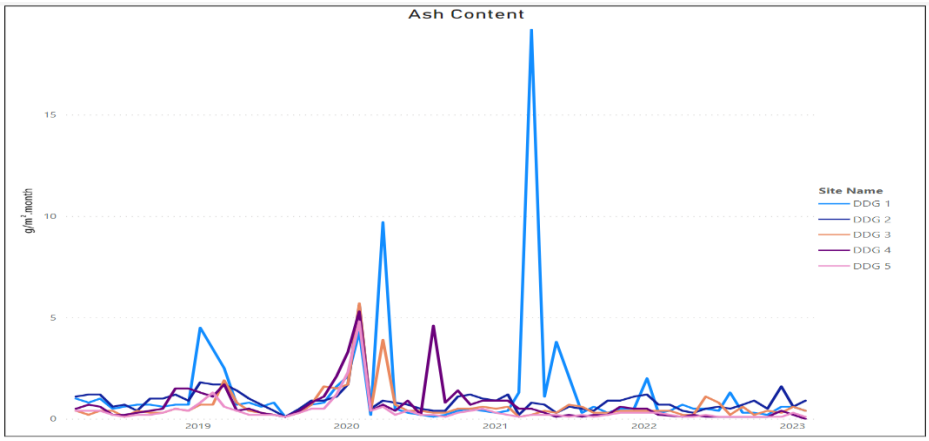
Graph 19: Total Insoluble Matter



8.5.1 Ash Content

There are no trigger values for ash content. As shown in the graph below, ash content continued to remain at low levels this reporting period. In the 2019/2020 severe bushfire season, ash content spiked to above 10 g/m^2/month at the peak.

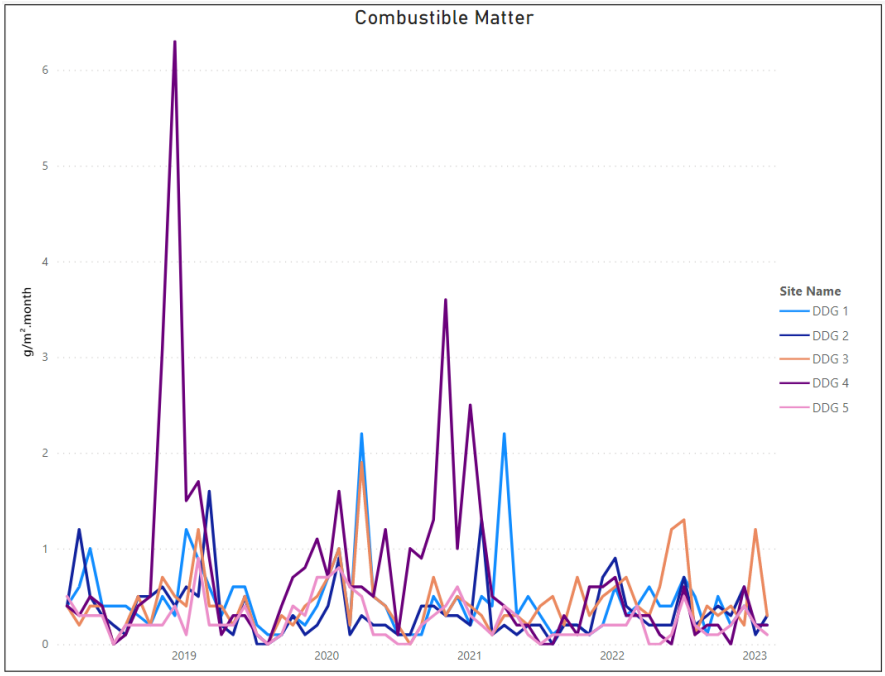
Graph 20: Ash Content



8.5.2 Combustible Matter

There are no trigger values for combustible matter. As shown in the graph below, combustible matter has been subject to fluctuations across the monitoring period, with levels significantly lower than the 2020/21 reporting period when bushfires were at their peak.

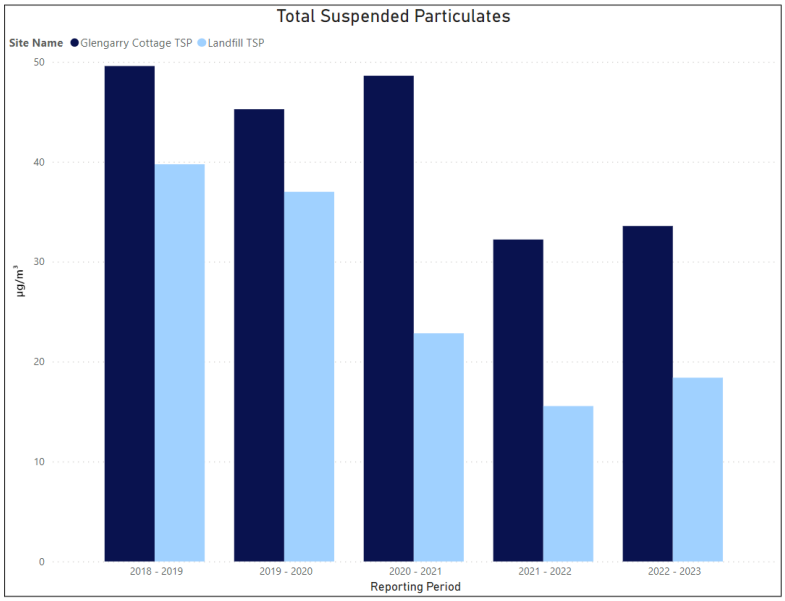
Graph 21: Combustible Matter



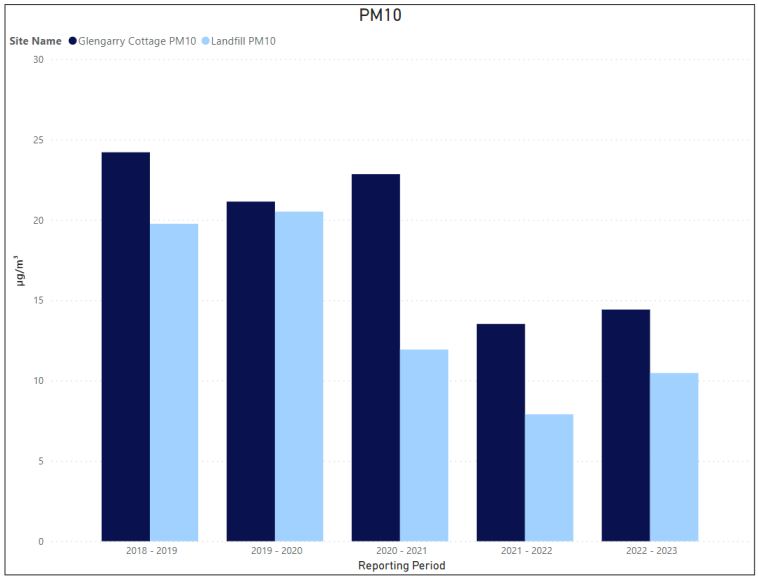
8.5.3 Rolling Monthly Average

As shown in the following graphs, there has been a continued decrease at DDG1 (Glengarry) and DDG2 (Whytes Gully) in the last reporting period.

Graph 22: TSP Rolling Monthly Average



Graph 23: PM_{10} Rolling Monthly Average



EA Predictions

The EA predictions made from dispersive modelling undertaken suggested that, should the implementation of appropriate mitigation and management measures undertaken, there would be compliance with the relevant legislative criteria at all potential offsite residences. During the operational phase of the project, the identified mitigation measures includes dust suppression, restriction of the active tipping face and required daily cover areas.

Overall, in this reporting period, measures have proved to be effective and are consistent with EA predictions.

9 Air Quality Monitoring – Odour

Odour management is required at the facility to satisfy Approval No. 11_0094 in Schedule 4, pertaining to 'Air Quality'. The findings 2022/23 reporting period are provided in the section below.

9.1 Overview

Whilst not a mandatory requirement, Council proactively undertakes odour inspections on a daily basis around the perimeter of the facility. This is undertaken in order to determine the source of any potential odour breaches, and where additional active management is required.

9.2 Performance Criteria

In reference to odour, EPL 5862 stipulates that no offensive odours are emitted beyond the boundary of the facility. As such, the performance criteria for potential offensive odour emissions are formal complaints received from the public and ad hoc offsite odour monitoring by the Council and EPA.

9.3 Results

Council received a total of 15 complaints from the public during the reporting period pertaining to offensive odours noted outside the facility's boundary. This is back to normal from the previous two reporting periods, where complaints had risen due to change in catchment use.

During the previous reporting periods, there were a number of changes in land use in the surrounding catchment. With the implementation of FOGO, increase in commercial organics composting has occurred in the industrial precinct adjacent to the facility. There has also been an increase in bitumen production in the same period, resulting in an increase in potential odour sources close to the landfill.

9.4 Conformances

Due to the changing nature of industrial production within the catchment, it has been difficult to identify the source of the odour complaints. However, Council has followed up on odour complaints, increased monitoring and ensured operations are conducted in accordance with best practice at all times.

The Air Quality Management Plan (August 2021) provides a detailed framework for odour management at the site.

9.5 Trends

There appears to be an overall decrease in complaints as the weather conditions settle back to a more normal pattern.

10 Noise Monitoring

Noise monitoring and management is required at the facility to satisfy Approval 11_0094 Conditions in Schedule 4, pertaining to noise.

10.1 Overview

Noise monitoring at the facility commenced in early March 2019 in accordance with the NSW Industrial Noise Policy (2000) and Whytes Gully New Landfill Cell Noise Management Plan (Golder 2019). Should any noise complaints be received, additional noise monitoring events will be undertaken. No noise complaints have been received in this reporting period.

10.2 Performance Criteria

The following criteria apply to the 5 residential receiver locations on the perimeter of the facility:

Residential Receiver Location	L_{Aeq}(15 min)
N1	47
N2	45
N3	38
N4	35
N5	35

10.3 Results

The following Table provides the results for the reporting period.

Table 10:1- Noise Monitoring Data

		Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23
N1													
Laeq	dB	no access	no access	no access	no access	no access	no access	no access	no access	no access	no access	no access	no access
Lamax	dB	no access	no access	no access	no access	no access	no access	no access	no access	no access	no access	no access	no access
N2													
Lamax	dB	no access	no access	no access	no access	no access	no access	no access	no access	no access	no access	no access	no access
Laeq	dB	no access	no access	no access	no access	no access	no access	no access	no access	no access	no access	no access	no access
N3													
Laeq	dB	69.1	70	70.1	72.7	72.1	71.1	72.2	68.1	69.4	no results	no results	no results
Lamax	dB	86.2	92.2	84.6	89.4	94.6	99	97.4	82.7	87.7	no results	no results	no results
N4											no results	no results	no results
Lamax	dB	50.8	46.3	52.4	53.7	54.9	51.2	58.2	53.6	no result	no results	no results	no results
Laeq	dB	76.3	68.9	74.4	73.3	73.3	73.9	81.9	72.9		no results	no results	no results
N5											no results	no results	no results
Laeq	dB	46.6	41	60.3	66.3	48.6	45.4		45.5	45.3	no results	no results	no results
Lamax	dB	64.3	63.7	75.8	90	73	60.8		63.5	66.4	no results	no results	no results

10.4 Conformances

The results from monthly monitoring at the perimeter receivers were predominantly non-conforming. This is not the result of noise emanating from the facility, but rather the surrounding catchment. Due to the change in land use discussed in the previous section, the noise criteria are now not achievable in a light industrial area. They were previously set when the area was a predominantly rural residential and are not applicable to current surrounding industrial land use.

10.5 Trends

Noise monitoring continued to be above threshold levels and will require review due to the change in surrounding catchment characteristics. Only limited sampling was able to be undertaken during this period due to ongoing wet weather resulting in some monitoring sites not able to be accessed.

11 Complaints, Incidences and Community Consultation

11.1 Complaints

During the 2022-23 reporting period, a total of 19 complaints were received. This is a significant decrease from the previous reporting period (109 complaints) and is in line with the previous years.

All complaints were pertaining to offensive odour and were reported through the EPA.

11.2 Incidents

Six environmental incidents were reported during the 2022/23 reporting period with five of the events directly related directly to the catastrophic weather event. The other was attributed to a small fire on the tip face.

11.2.1 Fire 12th September 2022

A small fire started at 3 pm on the tip face as a result of the waste compactor catching fire. The Operator exited safely, the Emergency Response Plan was activated and the Operations staff managed the situation until the Fire Services arrived. They were able to quickly extinguish the fire (by 4 pm) and ensure the site was safe. The compactor was safely relocated and secured by 6 pm for investigation and repair.

11.2.2 Leachate Overflow 6th October 2022

At approximately 10 am, the overflow (storage) leachate pond breached over the sandbag wall. Overflow was minimal to begin with, however increased steadily with the continual torrential rainfall. The Pollution Incident Response Management Plan (PIRMP) was implemented; and the situation managed as best as possible given the Declared Natural Disaster conditions.

11.2.3 Leachate Overflow 26th October 2022

At approximately 6.30 am, the overflow (storage) leachate pond breached over the sandbag wall. Overflow remained minimal over a period of approximately a week as rainfall decreased. The Pollution Incident Response Management Plan (PIRMP) was once again implemented; and the situation managed as best as possible given the Declared Natural Disaster conditions.

11.2.4 Stormwater Overflow 22nd May 2022

At approximately 6 pm, Stormwater Pond 3 overflowed after several days of heavy rainfall. The overflow continued for 4 days and testing was undertaken every 24 hours and one non-compliance noted on the 24th May 2022 (Total Suspended Solids reading was 72 mg/L).

The EPA declared a Natural Disaster during this time therefore no regulatory action was taken.

11.2.5 Leachate Overflow 26th October 2022

At approximately 10 am, the overflow (storage) leachate pond breached over the sandbag wall. Overflow was minimal to begin with, however increased steadily with the continual torrential rainfall. The Pollution Incident Response Management Plan (PIRMP) was implemented; and the situation managed as best as possible given the Declared Natural Disaster conditions.

11.2.6 Stormwater Overflow February - April 2022

The catastrophic flood evens that hit the Illawarra in the latter part of February though to early April 2022 significantly impacted the stormwater management system at Whytes Gully. This resulted in sporadic breaches on and off during the 51 day period. A total of 25 non-compliant water quality readings were recorded.

The EPA declared a Natural Disaster during this time therefore no regulatory action was taken.

11.3 Community Consultation

No consultation during this time due to the adverse weather conditions and short staffing.

12 Compliances and Non-compliances

In accordance with EPA Licence Conditions(EPL 5862), the facility generally operated in compliance during the 2022/22 reporting period despite the extremely challenging weather conditions.

In relation to the specific Project Approval No. 11_0094 compliance requirements, the last Independent Environmental Audit (2020) reported the facility generally operated in compliance with all conditions. In correspondence dated 15/02/2021 (Response to Audit Recommendations), the following table was to be addressed based on identified non-compliances.

Condition of Consent	Management Plan	Details on what will be revised	Submission Date
Schedule 3 Condition 2	Landfill Environmental Management Plan (LEMP)	The body of the main LEMP document.	Draft Document complete & being Council reviewed
Schedule 4 Condition 14	Soil, Water & Leachate Management Plan	Develop a Stormwater Management Plan	Approved
Schedule 4 Condition 17	Soil, Water & Leachate Management Plan	Develop a Leachate Management Plan	Approved
Schedule 4 Condition 18	Soil, Water & Leachate Management Plan	Finalise Entire Plan	Approved
Schedule 4 Condition 24	Air Quality Management Plan	Dust monitoring Plan and review of dust monitoring requirements at Whytes Gull7	Approved

The 2020 Independent Environmental Audit listed several conditions to be addressed in the following reporting period. These are summarised below:

Condition Number	Activity	Status
Schedule 3 Condition 2	Update the LEMP to reflect current practices	Draft Document complete & being reviewed by Council
Schedule 4 Condition 14	17 Stormwater Exceedances in the previous reporting period	Soil, Water & Leachate Management Plan complete and implemented.
Schedule 4 Condition 15	Development of a Stormwater Management Plan	Soil, Water & Leachate Management Plan complete and implemented.
Schedule 4 Condition 17	Review and update the Leachate Management System	Soil, Water & Leachate Management Plan complete and implemented.
Schedule 4 Condition 24	A review of dust monitoring requirements will be undertaken	Air Quality Management Plan complete and implemented.
Schedule 4 Condition 30	A greenhouse gas management plan will be developed	Draft Document complete & being reviewed by Council

13 Recommendations

In accordance with the formal recommendations presented in correspondence from DPE from the previous reporting period relating the findings of the IEA and the outcomes of this AEMR, Council proposes to address the following in the next reporting period:

- Schedule 3 Condition 2 Landfill Environmental Management Plan.
    - The body of the main document of the Landfill Environmental Management Plan to be updated by the 15th February 2024.
- Schedule 4 Condition 30 Greenhouse Gas Management Plan
    - Complete the final plan by 1st March 2024.

- Reinstatement of community consultation program next reporting period

It is also recommended to undertake a review of surrounding noise levels based on the change in catchment use.

14 Conclusions

This reporting period has seen continued torrential rainfall and posed significant challenges for Waste Services staff to manage the site in accordance with the Approval. However, improved management practices have seen a decrease in non-compliances pertaining to site stormwater and leachate management under normal weather conditions.

One of the key areas of compliance improvement is the reduction of odour complaints received this reporting period. This is a very complex area as there are a number of odour producing industries located in the precinct and in close proximity to Whytes Gully. However, the EPA has been working closely with stakeholders in the area and it has positively influenced the outcome.

APPENDICES

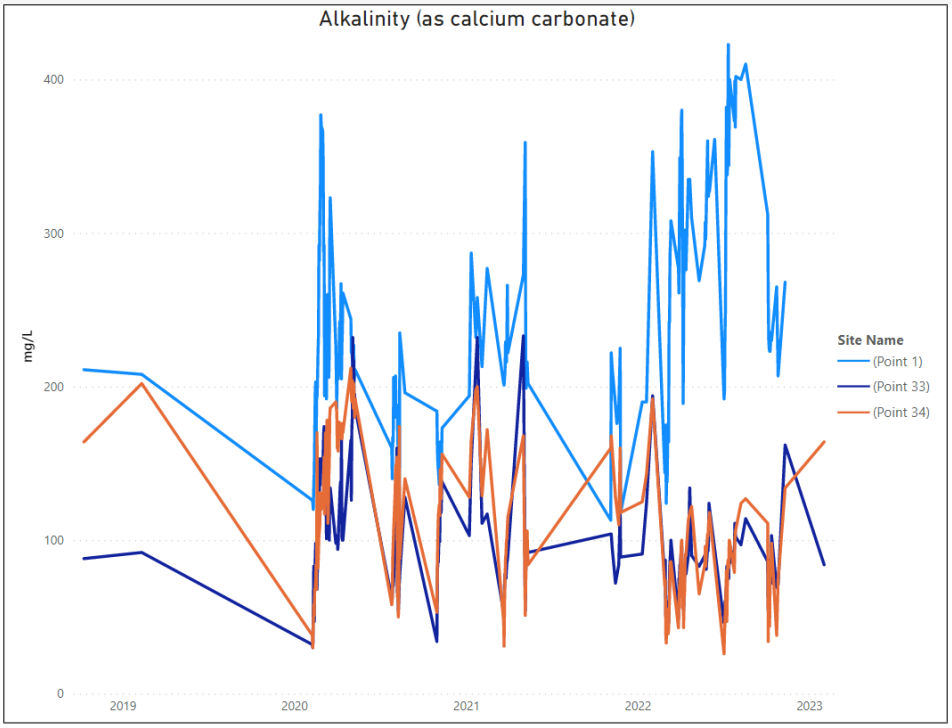
Appendix A: Surface Water: Tabulated Results and Trends (2022/23)

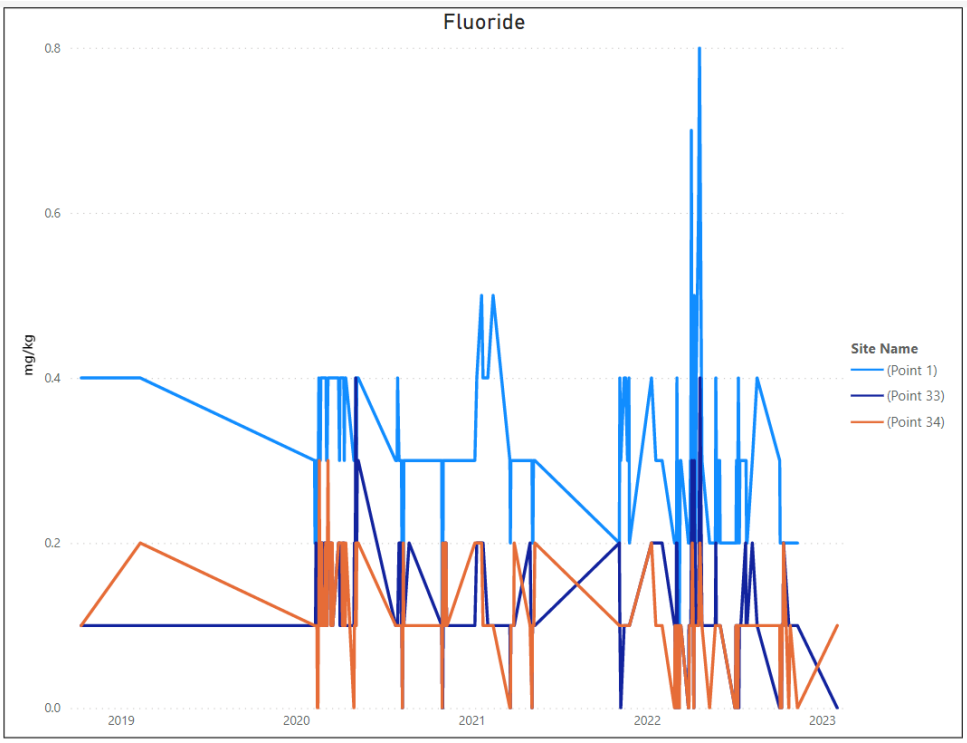
Table 1: Surface Water Results

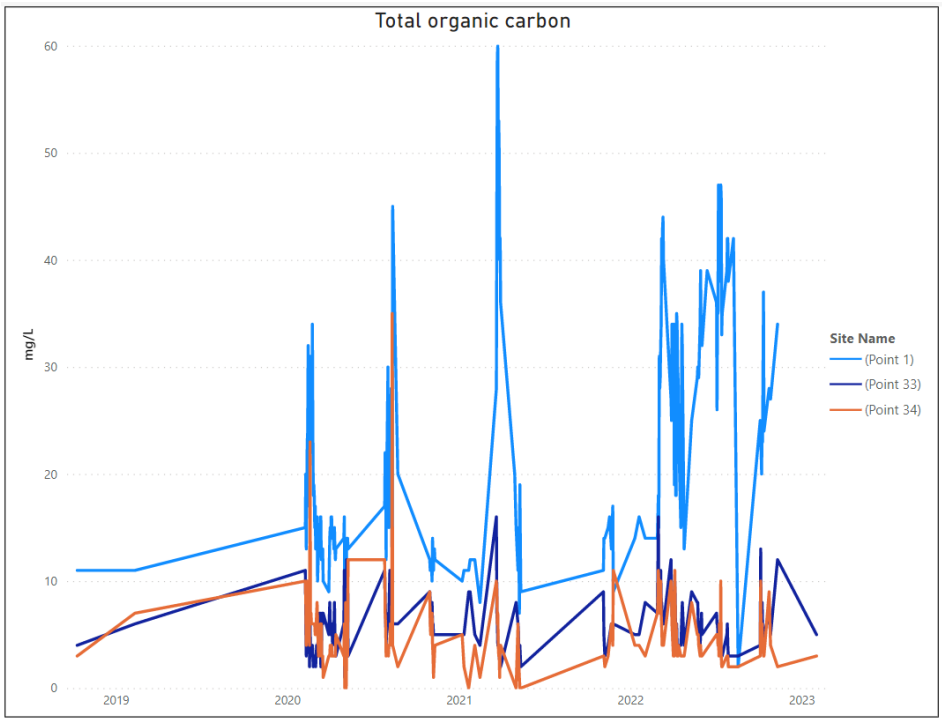
		Alkalinity (as calcium carbonate)	Ammonia	Calcium	Chloride	Conductivity	Dissolved Oxygen	Filterable iron	Fluoride	Magnesium	Nitrate as N	pH	Potassium	Sodium	Sulfate	Temperature	Total organic carbon	Total Phenolics	Total suspended solids
Units		mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/kg	mg/L	mg/L	pH	mg/L	mg/L	mg/L	°C	mg/L	mg/L	mg/L
Site Name	Sample Date																		
(Point 1)	02/03/2022	164	0.88	32	27	390	7.42	0.21	0.2	13	<0.01	7.8	8	35	12	20.7	18	<0.05	70
	03/03/2022	124	0.80	28	23	326	6.34	0.13	0.2	11	<0.01	7.8	7	28	11	20.7	15	<0.05	69
	04/03/2022	146	1.60	36	28	339	5.41	0.06	0.2	14	<0.01	7.7	10	34	11	24.3	31	<0.05	38
	05/03/2022	138	1.90	32	26	434	4.67	0.28	0.4	12	<0.01	7.6	7	34	10	23.0	28	<0.05	24
	06/03/2022	163	2.91	33	30	471	4.66	0.22	0.2	13	<0.01	7.7	9	40	9	22.1	29	<0.05	20
	07/03/2022	176	7.43	32	40	547	5.87	0.14	0.2	14	<0.01	7.8	13	52	8	23.5	32	<0.05	65
	08/03/2022	164	9.50	27	33	462	6.43	0.11	0.2	11	<0.01	7.9	13	42	6	21.8	34	<0.05	76
	09/03/2022	242	12.7	29	48	614	5.69	0.18	0.2	12	<0.01	7.8	16	54	7	21.7	42	<0.05	64
	10/03/2022	242	15.6	30	62	695	3.71	0.36	0.1	13	<0.01	7.8	16	59	6	20.3	38	<0.05	58
	11/03/2022	286	17.1	34	63	756	2.28	0.47	0.2	15	<0.01	7.8	22	71	1	21.1	43	<0.05	104
	12/03/2022	293	17.8	34	67	796	2.32	0.49	0.3	15	<0.01	7.9	20	68	5	19.6	44	<0.05	34
	13/03/2022	308	18.5	34	73	835	3.20	0.43	0.3	15	<0.01	7.9	21	71	2	20.1	40	<0.05	27
	29/03/2022	277	15.7	39	80	899	7.37	0.18	0.2	20	<0.01	8.0	22	85	13	20.4	27	<0.05	39
	30/03/2022	261	12.2	38	62	791	4.32	0.12	0.2	17	<0.01	8.1	18	72	14	21.3	25	<0.05	52
	31/03/2022	310	16.2	40	84	911	3.45	0.24	0.2	19	<0.01	8.1	24	87	14	20.1	34	<0.05	46
	01/04/2022	349	26.0	45	95	1020	1.09	0.38	0.2	22	<0.01	8.0	29	106	12	19.0	31	<0.05	330
	02/04/2022	345	20.7	44	93	1030	1.47	0.34	0.3	20	<0.01	7.9	30	112	12	18.5	29	<0.05	30
	03/04/2022	342	20.5	44	106	1020	1.44	0.33	0.3	20	<0.01	7.9	30	109	13	18.3	32	<0.05	26
	04/04/2022	373	22.4	42	96	996	3.28	0.28	0.7	19	<0.01	7.9	28	104	12	23.4	34	<0.05	20
	05/04/2022	380	11.0	64	154	1190	0.83	2.28	0.4	31	<0.01	7.4	14	118	26	19.4	19	<0.05	200
	06/04/2022	345	16.7	39	87	920	8.49	0.26	0.3	19	<0.01	8.7	27	96	12	21.0	31	<0.05	20
	08/04/2022	189	9.26	26	40	503	3.29	0.24	0.2	11	<0.01	8.2	15	45	14	19.0	18	<0.05	81
	09/04/2022	240	13.4	27	55	627	5.77	0.14	0.2	12	0.01	8.2	20	58	13	18.8	18	<0.05	60
	10/04/2022	288	19.0	34	75	860	3.89	0.21	0.5	15	<0.01	8.4	26	78	14	19.3	35	<0.05	30
	11/04/2022	296	17.0	37	73	813	0.24	0.44	0.2	16	<0.01	7.1	24	76	14	22.0	34	<0.05	18
	12/04/2022	302	14.8	40	77	838	0.24	0.56	0.4	16	0.01	7.9	23	78	14	21.2	30	<0.05	28
	13/04/2022	281	16.7	40	88	867	0.26	0.50	0.2	16	0.02	7.9	24	80	13	19.8	29	<0.05	20
	14/04/2022	276	13.9	45	66	821	0.62	0.33	0.4	17	0.02	8.0	19	76	17	19.9	24	<0.05	24
	19/04/2022	335	4.00	68	196	1240	3.02	4.18	0.6	34	0.05	7.2	6	132	33	19.6	15	<0.05	29
	21/04/2022	321	18.2	35	94	938	7.46	0.38	0.8	16	<0.01	8.4	25	91	10	19.8	34	<0.05	6
	22/04/2022	335	17.6	41	95	936	4.85	0.52	0.7	23	0.04	8.1	26	97	10	17.6	32	<0.05	49
	26/04/2022	310	5.66	68	121	987	2.97	1.07	0.3	31	<0.01	7.4	11	98	22	17.7	13	<0.05	30
	12/05/2022	269	8.40	38	96	898	8.28	0.42	0.2	20	0.60	8.3	23	100	20	18.8	25	<0.05	11
	24/05/2022	292	12.8	39	103	999	5.92	0.20	0.2	20	0.56	8.0	27	100	22	14.7	29	<0.05	72
	25/05/2022	307	13.6	40	105	978	6.33	0.20	0.4	20	0.82	8.2	29	109	19	14.4	30	<0.05	28
	26/05/2022	296	14.4	38	108	1010	5.18	0.19	0.3	19	0.65	8.1	29	105	21	13.7	30	<0.05	46
	27/05/2022	312	11.3	45	107	1010	4.98	0.20	0.2	21	0.54	8.0	33	108	20	15.5	29	<0.05	52
	30/05/2022	360	13.6	39	117	1060	8.71	0.28	0.3	18	0.15	8.4	31	112	20	14.6	34	<0.05	24
	31/05/2022	326	13.5	46	117	1070	8.77	0.23	0.3	21	<0.01	8.3	36	119	17	13.6	39	<0.05	16
	01/06/2022	324	13.4	45	119	1050	8.79	0.23	0.3	21	0.33	8.2	36	115	17	10.0	34	<0.05	14
	02/06/2022	334	11.0	47	114	1070	9.05	0.25	0.3	22	0.03	8.3	36	117	17	12.0	33	<0.05	14
	03/06/2022	327	13.4	46	111	1070	10.1	0.26	0.2	22	0.12	8.5	32	122	18	11.6	32	<0.05	44
	14/06/2022	361	12.7	47	127		8.9	0.42	0.2	22	0.24		43	121	15		39	<0.05	68
	04/07/2022	192	11.8	42	95	906	3.73	0.20	0.2	16	4.60	7.8	30	102	28	15.2	36	<0.05	41
	05/07/2022	197	10.4	34	85	831	4.29	0.18	0.2	14	<0.01	8.1	27	88	24	14.0	26	<0.05	37
	06/07/2022	233	12.6	34	105	930	7.90	0.20	0.2	16	<0.01	8.8	30	100	27	13.4	35	<0.05	36
	07/07/2022	250	13.4	41	119	982	6.74	0.18	0.3	20	<0.01	8.6	34	117	26	15.2	35	<0.05	26
	08/07/2022	327	18.7	40	156	1270	5.40	0.26	0.3	20	<0.10	8.8	43	148	22	14.2	47	<0.05	27
	09/07/2022	382	27.4	45	156	1250	8.56	0.27	0.2	21	<0.01	8.6	41	141	29	11.5	40	<0.05	31
	10/07/2022	359	22.0	44	154	1270	7.53	0.22	0.3	22	<0.01	8.5	43	139	28	12.8	38	<0.05	23
	11/07/2022	338	20.6	42	156	1260	6.41	0.28	0.4	22	<0.01	8.6	44	152	28	14.6	41	<0.05	14
	12/07/2022	363	17.7	41	159	1270	7.99	0.25	0.3	21	<0.01	8.4	41	142	28	14.6	39	<0.05	16
	13/07/2022	423	19.4	49	157	1320	8.14	0.30	0.2	22	<0.01	8.4	43	144	26	14.1	47	<0.05	15
	14/07/2022	344	17.7	43	154	1330	8.16	0.28	0.3	21	<0.01	8.5	42	142	27	12.8	46	<0.05	18
	15/07/2022	370	16.9	53	165	130	4.52	0.41	0.3	24	<0.01	7.8	40	143	32	10.6	33	<0.05	89
	16/07/2022	400	17.1	48	150	1310	3.66	0.40	0.3	24	<0.01	8.1	37	139	33	14.0	35	<0.05	12
	26/07/2022	373	14.1	54	140	1190	6.65	0.29	0.3	24	0.37	8.2	35	127	29	15.7	39	<0.05	74
	27/07/2022	399	17.1	67	145	1260	7.56	0.35	0.3	29	0.06	8.3	42	154	28	12.2	42	<0.05	54
	28/07/2022	369	16.2	53	155	1280	8.64	0.33	0.2	27	0.01	8.4	40	143	27	15.8	42	<0.05	52
	29/07/2022	402	15.6	61	152	1270	6.09	0.55	0.2	28	0.15	8.0	39	136	30	12.8	38	<0.05	39
	09/08/2022	400	12.2	56	168	1260	9.61	0.22	0.3	27	1.54	8.6	42	149	29	15.0	42	<0.05	20
	19/08/2022	410	7.27	90	319	1720	6.09	0.41	0.4	41	0.10	7.4	21	181	54	14.6	2	<0.05	26
	05/10/2022	312	6.22	48	130	1100	8.16	<0.05	0.3	27	0.14	7.8	28	120	31	17.1	25	<0.05	10
	06/10/2022	260	5.94	43	98	920	8.79	0.09	0.2	22	<0.01	8.0	26	98	31	16.4	23	<0.05	35
	07/10/2022	231	7.29	40	92	867	6.60	0.09	0.2	20	0.13	7.8	26	100	28	18.1	22	<0.05	72
	08/10/2022	225	7.62	40	91	864	6.52	0.08	0.2	18	0.11	7.8	27	87	29	18.8	20	<0.05	48
	09/10/2022	223	8.16	37	90	877	8.27	0.09	0.2	17	<0.01	7.9	28	88	26	17.1	24	<0.05	42
	10/10/2022	223	7.10	38	79	812	7.32	0.08	0.2	16	<0.01	8.0	25	78	26	16.3	23	<0.05	39
	12/10/2022	235	8.05	36	88	875	7.73	0.08	0.2	17	<0.01	7.8	24	90	27	18.4	37	<0.05	9
	13/10/2022	230	8.64	36	88	880	8.25	0.07	0.2	18	<0.01	7.7	27	144	28	19.4	24	<0.05	8
	24/10/2022	265	9.78	37	117	1010	8.00	0.08	0.2	20	0.36	8.1	38	122	27	19.8	28	<0.05	13
	27/10/2022	207	8.67	33	102	916	6.11	0.13	0.2	16	0.50	8.0	29	104	23	20.9	27	<0.05	33
	11/11/2022	268	7.46	37	124	1020	8.12	0.05	0.2	18	4.86	8.2	30	111	25	21.1	34	<0.05	9

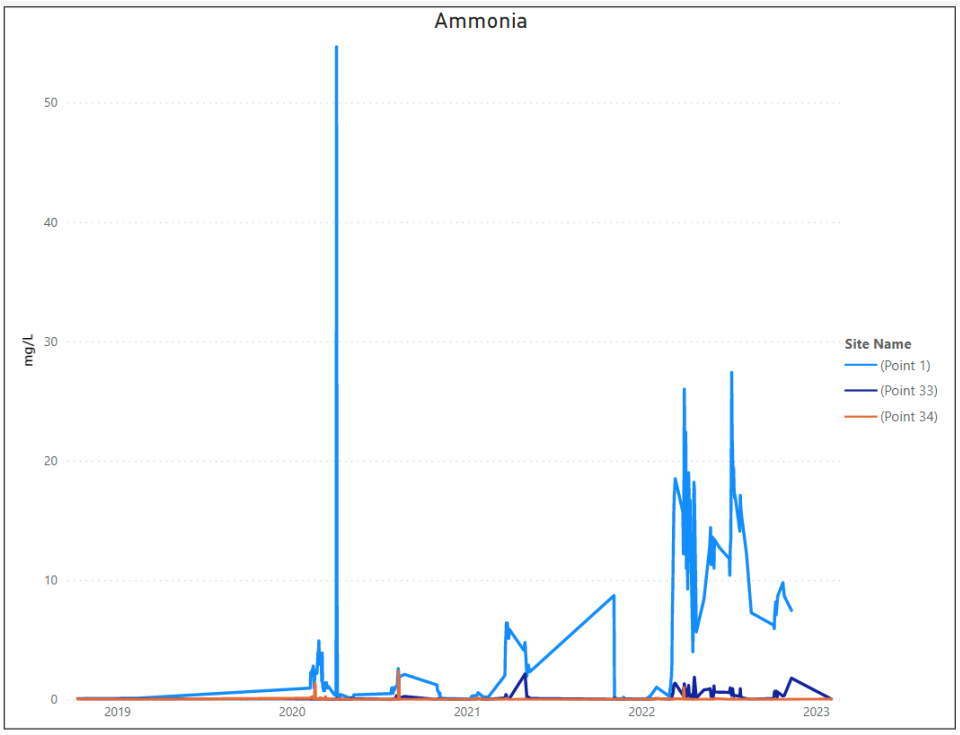
		Alkalinity (as calcium carbonate)	Ammonia	Calcium	Chloride	Conductivity	Dissolved Oxygen	Filterable iron	Fluoride	Magnesium	Nitrate as N	pH	Potassium	Sodium	Sulfate	Temperature	Total organic carbon	Total Phenolics	Total suspended solids
Units		mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/kg	mg/L	mg/L	pH	mg/L	mg/L	mg/L	°C	mg/L	mg/L	mg/L
Site Name	Sample Date																		
(Point 33)	02/03/2022	52	0.07	11	16	152	7.82	0.37	<0.1	5	0.31	7.0	5	14	5	19.8	16	<0.05	174
	03/03/2022	46	0.04	14	20	175	8.43	0.22	<0.1	6	0.29	7.3	4	16	11	20.3	9	<0.05	102
	04/03/2022	53	0.08	15	23	200	7.70	0.18	0.2	7	0.29	7.0	4	17	12	22.2	9	<0.05	48
	05/03/2022	60	0.09	16	24	237	7.75	0.46	0.2	8	0.26	7.2	3	19	12	20.8	8	<0.05	24
	06/03/2022	56	0.09	16	24	238	7.36	0.20	0.1	8	0.20	7.2	3	19	11	20.3	9	<0.05	34
	07/03/2022	46	0.46	11	15	160	7.51	0.31	<0.1	5	0.21	7.1	4	14	6	22.6	11	<0.05	146
	08/03/2022	46	0.46	11	17	169	7.27	0.26	<0.1	5	0.30	7.0	4	14	10	21.1	8	<0.05	91
	09/03/2022	58	0.76	13	23	214	7.49	0.20	<0.1	7	0.29	7.2	4	18	11	20.7	8	<0.05	56
	10/03/2022	79	1.22	16	30	274	8.50	0.15	0.1	8	0.31	7.7	3	20	14	18.7	7	<0.05	22
	11/03/2022	86	1.15	20	31	275	8.30	0.12	0.1	10	0.30	7.3	4	24	15	19.8	6	<0.05	17
	12/03/2022	92	1.36	19	34	322	8.78	0.25	0.1	10	0.28	7.5	4	23	15	17.6	6	<0.05	8
	13/03/2022	100	1.36	21	35	331	8.39	0.13	0.1	10	0.26	7.5	4	24	16	18.6	6	<0.05	9
	29/03/2022	49	0.37	13	14	162	8.16	0.28	<0.1	6	0.19	7.4	6	14	<1	19.1	12	<0.05	524
	30/03/2022	75	0.89	16	24	271	7.81	0.20	0.1	8	0.26	7.5	4	23	13	19.5	9	<0.05	43
	31/03/2022	74	0.81	16	25	264	8.33	0.22	0.1	8	0.18	7.3	4	23	12	17.9	8	<0.05	49
	01/04/2022	84	1.32	18	31	305	8.35	0.36	0.1	9	0.22	7.4	4	26	13	18.5	6	<0.05	20
	02/04/2022	84	0.91	22	37	312	8.06	0.14	0.1	10	0.18	7.3	4	28	14	16.0	5	<0.05	18
	03/04/2022	89	0.84	22	40	324	8.09	0.12	0.1	10	0.26	7.3	3	28	16	16.5	4	<0.05	13
	04/04/2022	93	0.88	24	35	330	7.77	0.11	0.2	11	0.26	7.3	4	30	16	17.9	5	<0.05	6
	05/04/2022	96	0.19	22	35	327	8.13	0.11	0.3	11	0.21	7.2	3	24	17	17.0	4	<0.05	8
	06/04/2022	70	0.29	17	27	241	8.09	0.14	0.1	8	0.41	7.3	6	21	11	18.1	10	<0.05	214
	08/04/2022	66	0.64	14	25	218	8.12	0.24	0.1	8	0.34	7.0	4	20	14	18.8	5	<0.05	42
	09/04/2022	54	0.54	12	20	177	8.64	0.27	<0.1	6	0.24	7.4	4	16	9	18.7	6	<0.05	97
	10/04/2022	67	1.18	15	26	274	8.25	0.27	0.3	8	0.26	7.3	4	22	13	18.4	6	<0.05	25
	11/04/2022	76	0.50	17	30	243	7.89	0.31	0.1	10	0.30	7.4	4	23	16	18.3	4	<0.05	10
	12/04/2022	78	0.30	19	30	284	8.34	0.22	0.2	9	0.28	7.3	3	22	15	18.3	4	<0.05	10
	13/04/2022	80	0.22	21	33	290	8.69	0.10	0.1	10	0.27	7.3	3	23	16	17.2	4	<0.05	11
	14/04/2022	78	0.40	20	36	305	8.66	0.09	0.1	10	0.26	7.2	3	24	16	16.6	4	<0.05	14
	19/04/2022	90	0.06	25	42	359	8.66	0.09	0.1	12	0.22	7.6	2	31	20	20.5	4	<0.05	5
	22/04/2022	134	1.87	29	55	452	7.78	0.17	0.4	17	0.35	7.5	8	38	18	17.4	8	<0.05	6
	26/04/2022	90	0.13	29	40	389	8.85	0.25	0.1	14	0.20	7.6	3	32	18	17.1	4	<0.05	7
	12/05/2022	83	0.81	18	29	293	8.47	0.22	0.1	8	0.48	7.3	5	27	12	18.7	9	<0.05	42
	24/05/2022	90	0.88	19	33	310	9.29	0.12	0.1	9	0.67	7.7	4	27	14	14.6	8	<0.05	9
	25/05/2022	82	0.91	18	26	281	9.37	0.24	0.2	9	0.61	7.8	5	26	12	14.5	8	<0.05	57
	26/05/2022	85	0.67	18	32	317	9.59	0.18	0.1	8	0.67	7.5	3	25	13	13.3	6	<0.05	18
	27/05/2022	81	0.26	21	34	315	9.68	0.09	0.1	10	0.37	7.3	3	24	15	14.0	5	<0.05	10
	30/05/2022	95	0.21	23	41	361	9.63	0.14	0.1	11	0.33	7.5	2	28	19	13.1	4	<0.05	8
	31/05/2022	93	0.20	27	39	374	9.65	0.07	0.1	12	0.39	7.5	3	31	16	13.4	5	<0.05	8
	01/06/2022	100	0.38	26	50	378	9.79	0.09	0.1	12	0.44	7.4	4	31	17	9.3	5	<0.05	<5
	02/06/2022	124	1.14	31	56	447	9.17	0.16	0.1	15	0.64	7.4	7	41	20	10.8	7	<0.05	5
	03/06/2022	121	0.63	30	52	441	8.89	0.11	0.1	14	0.50	7.7	4	38	22	13.4	5	<0.05	8
	04/07/2022	46	0.60	13	23	194	9.51	0.23	<0.1	7	0.43	7.4	5	19	10	15.2	7	<0.05	56
	05/07/2022	46	0.74	11	25	212	9.63	0.24	<0.1	5	0.18	7.4	4	19	12	14.3	6	<0.05	31
	06/07/2022	60	0.97	14	32	275	10.2	0.12	0.1	7	0.18	7.7	4	23	14	12.0	6	<0.05	27
	07/07/2022	60	0.66	16	31	262	9.73	0.10	0.1	8	0.39	7.5	4	24	15	14.2	5	<0.05	22
	08/07/2022	66	0.48	15	34	278	10.1	0.06	0.1	8	0.40	7.6	3	27	14	14.2	4	<0.05	14
	09/07/2022	69	0.35	18	33	275	11.3	0.09	<0.1	10	0.36	7.7	3	23	16	10.7	4	<0.05	12
	10/07/2022	83	0.58	21	37	313	11.0	<0.05	0.1	10	0.45	7.4	4	26	18	11.5	4	<0.05	27
	11/07/2022	76	0.91	18	36	308	10.1	0.09	0.1	9	0.30	7.8	4	30	16	14.5	6	<0.05	14
	12/07/2022	76	0.49	18	37	309	10.5	<0.05	<0.1	9	0.36	7.4	3	27	17	14.1	4	<0.05	7
	13/07/2022	77	0.41	22	38	333	10.6	<0.05	0.1	11	0.38	7.5	3	27	17	13.5	4	<0.05	8
	14/07/2022	75	0.30	22	40	353	10.6	0.05	0.1	10	0.35	7.8	3	27	18	12.3	3	<0.05	10
	15/07/2022	92	0.33	23	52	365	11.4	0.09	0.1	11	0.34	7.2	3	30	19	9.5	3	<0.05	8
	16/07/2022	85	0.34	22	41	364	10.5	0.07	0.1	11	0.35	7.8	3	27	20	12.8	3	<0.05	10
	26/07/2022	94	0.27	24	50	366	9.44	0.09	0.2	11	0.32	7.6	3	30	19	15.4	5	<0.05	7
	27/07/2022	111	0.91	32	50	433	9.98	0.16	0.1	15	0.44	7.6	6	41	20	10.8	6	<0.05	8
	28/07/2022	104	0.32	25	45	395	10.1	<0.05	0.1	12	0.37	7.5	3	33	20	12.7	4	<0.05	<5
	29/07/2022	102	0.17	29	56	414	10.2	0.13	0.1	14	0.20	7.6	4	33	22	12.6	3	<0.05	9
	09/08/2022	97	0.07	32	55	445	10.5	<0.05	0.2	16	0.16	7.7	3	40	25	14.7	3	<0.05	10
	19/08/2022	114	0.04	37	57	473	11.5	0.12	0.1	15	0.13	7.7	3	34	25	12.2	3	<0.05	<5
	05/10/2022	86	0.08	22	35	355	9.31	0.06	<0.1	10	0.19	7.2	3	29	14	15.8	4	<0.05	10
	06/10/2022	54	0.49	12	21	203	10.2	0.24	<0.1	6	0.34	7.6	6	20	7	15.8	13	<0.05	487
	07/10/2022	87	0.70	17	50	307	9.11	0.14	0.1	9	0.56	7.4	4	29	20	17.6	6	<0.05	33
	08/10/2022	87	0.51	19	32	303	8.64	0.07	0.1	9	0.50	7.2	4	28	14	16.3	4	<0.05	19
	09/10/2022	54	0.68	13	22	229	10.0	0.22	<0.1	6	0.29	7.4	5	20	10	15.0	8	<0.05	85
	10/10/2022	86	0.70	18	30	328	9.68	0.09	0.1	8	0.63	6.9	5	26	14	15.1	6	<0.05	28
	12/10/2022	72	0.14	16	29	272	9.79	<0.05	0.1	8	0.32	6.7	2	21	14	17.3	4	<0.05	<5
	13/10/2022	103	0.63	21	35	346	9.22	<0.05	0.2	10	0.72	7.1	4	39	16	18.7	5	<0.05	7
	24/10/2022	69	0.29	16	28	245	9.38	0.21	0.1	8	0.39	7.5	5	25	12	18.7	7	<0.05	105
	27/10/2022	71	0.34	16	29	275	8.78	0.08	0.1	8	0.63	7.0	3	24	15	19.6	5	<0.05	16
	11/11/2022	162	1.79	33	79	630	6.85	0.09	0.1	15	2.39	7.6	11	59	24	20.4	12	<0.05	8
	02/02/2023	84	0.05	19	23	260	5.64	0.05	<0.1	6	0.03	7.0	2	23	9	26.7	5	<0.05	<5

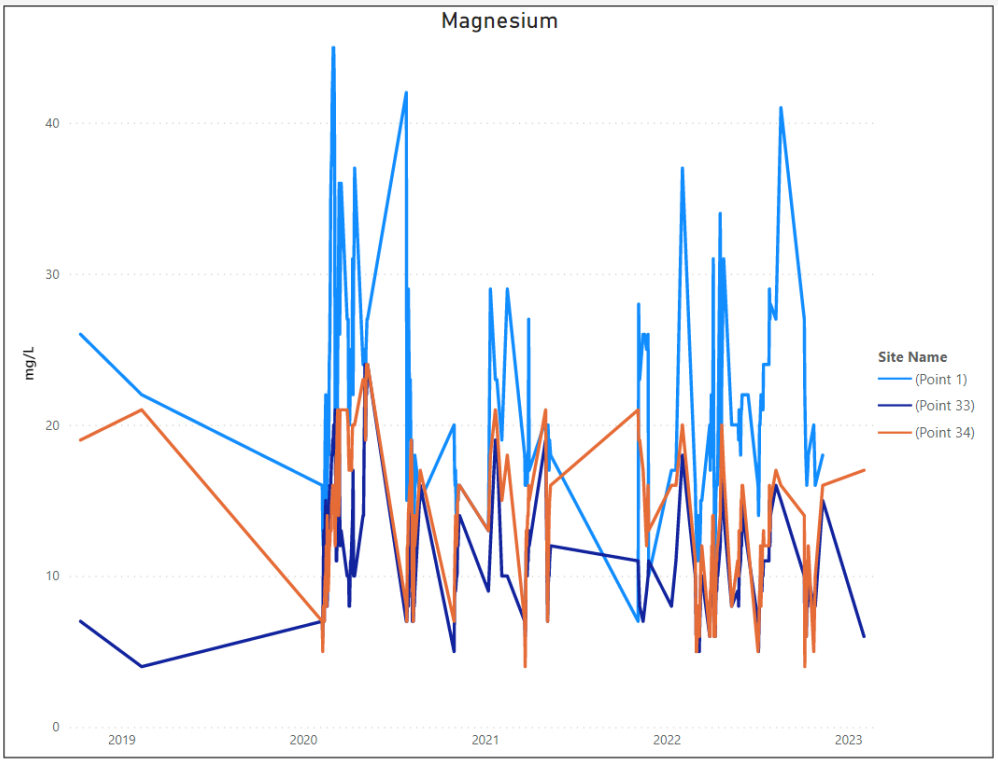
		Alkalinity (as calcium carbonate)	Ammonia	Calcium	Chloride	Conductivity	Dissolved Oxygen	Filterable iron	Fluoride	Magnesium	Nitrate as N	pH	Potassium	Sodium	Sulfate	Temperature	Total organic carbon	Total Phenolics	Total suspended solids
Units		mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/kg	mg/L	mg/L	pH	mg/L	mg/L	mg/L	°C	mg/L	mg/L	mg/L
Site Name	Sample Date																		
(Point 34)	02/03/2022	39	0.05	11	17	139	9.54	0.24	<0.1	5	0.35	7.2	4	12	8	20.7	11	<0.05	250
	03/03/2022	33	0.01	10	17	122	9.91	0.38	<0.1	5	0.21	7.8	4	12	6	19.6	10	<0.05	282
	04/03/2022	44	0.04	15	27	203	9.24	0.18	<0.1	8	0.24	7.4	4	18	14	21.1	8	<0.05	160
	05/03/2022	55	0.02	16	27	245	9.24	0.48	0.1	8	0.20	7.5	3	20	14	19.9	7	<0.05	60
	06/03/2022	52	0.05	16	27	242	9.42	0.21	0.1	8	0.18	7.5	3	20	14	19.5	8	<0.05	62
	07/03/2022	39	0.07	11	18	168	9.00	0.30	<0.1	6	0.24	7.4	4	15	11	21.6	10	<0.05	175
	08/03/2022	42	<0.01	12	22	188	9.26	0.24	<0.1	6	0.27	7.3	4	16	15	20.2	7	<0.05	123
	09/03/2022	54	0.04	16	28	226	9.42	0.17	0.1	8	0.24	7.4	4	18	16	19.3	6	<0.05	190
	10/03/2022	63	0.02	18	33	282	10.3	0.10	<0.1	9	0.23	7.8	3	20	20	17.8	4	<0.05	48
	11/03/2022	79	0.03	22	36	315	10.4	0.05	0.1	11	0.22	7.7	3	24	22	18.9	5	<0.05	26
	12/03/2022	86	0.07	23	40	344	10.8	<0.05	0.1	11	0.21	7.7	3	24	24	16.7	4	<0.05	14
	13/03/2022	86	0.06	25	41	355	10.8	<0.05	0.1	12	0.21	7.8	3	25	24	17.3	4	<0.05	28
	29/03/2022	43	0.04	12	14	160	9.57	0.36	<0.1	6	0.41	7.8	4	13	4	18.8	10	<0.05	342
	30/03/2022	60	0.02	16	26	266	9.27	0.18	<0.1	9	0.25	7.8	3	21	19	18.8	9	<0.05	48
	31/03/2022	69	1.00	17	29	276	9.89	0.18	0.1	9	0.86	7.7	3	22	16	17.3	6	<0.05	54
	01/04/2022	74	0.02	19	32	304	9.85	0.21	0.1	10	0.19	7.4	3	24	19	18.3	5	<0.05	36
	02/04/2022	81	0.04	24	44	325	9.94	0.07	0.1	12	0.18	7.3	3	28	21	15.7	4	<0.05	39
	03/04/2022	88	0.02	25	47	353	9.89	<0.05	0.1	12	0.17	7.5	3	28	23	16.3	3	<0.05	18
	04/04/2022	98	0.04	30	41	376	9.83	<0.05	0.1	14	0.16	7.4	3	31	24	18.0	4	<0.05	13
	05/04/2022	100	<0.01	30	42	395	9.92	<0.05	0.1	14	0.16	7.5	2	28	26	16.5	3	<0.05	14
	06/04/2022	56	0.01	12	20	179	10.1	0.23	0.2	6	0.34	7.4	4	14	8	17.7	11	<0.05	273
	08/04/2022	64	0.01	15	30	246	9.82	0.21	0.1	9	0.30	7.3	3	21	17	18.1	4	<0.05	43
	09/04/2022	43	0.07	10	19	160	9.58	0.30	<0.1	6	0.19	7.4	4	14	9	18.6	6	<0.05	312
	10/04/2022	64	0.02	16	29	268	9.47	0.16	0.1	9	0.21	7.5	3	21	18	18.6	4	<0.05	28
	11/04/2022	64	0.02	20	34	299	9.64	0.25	0.1	11	0.20	7.3	3	24	21	18.6	3	<0.05	18
	12/04/2022	86	0.02	22	36	328	9.55	0.07	0.1	11	0.19	7.4	3	24	23	18.9	4	<0.05	18
	13/04/2022	91	0.03	27	54	356	10.0	<0.05	0.1	12	0.20	7.5	3	27	24	17.1	3	<0.05	14
	14/04/2022	90	0.02	25	42	342	10.2	0.06	0.1	12	0.18	7.3	3	26	22	16.5	4	<0.05	19
	19/04/2022	113	<0.01	30	51	424	9.91	<0.05	0.1	14	0.14	7.7	2	30	29	17.4	3	<0.05	6
	22/04/2022	118	<0.01	36	57	451	10.5	<0.05	0.2	20	0.11	7.6	3	31	30	17.0	3	<0.05	<5
	26/04/2022	122	<0.01	38	58	466	10.7	0.05	0.1	17	0.08	8.1	3	37	28	17.0	3	<0.05	<5
	12/05/2022	65	0.02	17	26	244	9.37	0.21	<0.1	8	0.48	7.3	3	20	16	18.9	8	<0.05	43
	24/05/2022	84	0.01	21	36	317	10.6	0.09	0.1	11	0.30	7.7	2	25	19	14.6	5	<0.05	14
	25/05/2022	96	0.02	19	28	279	10.6	0.20	0.1	10	0.32	7.7	3	24	17	14.4	5	<0.05	18
	26/05/2022	83	0.01	21	36	340	11.0	0.11	0.1	10	0.25	7.5	2	25	18	13.2	5	<0.05	12
	27/05/2022	90	0.04	27	42	376	10.4	<0.05	0.1	13	0.22	7.6	3	29	22	15.0	4	<0.05	14
	30/05/2022	104	<0.01	28	47	420	10.3	<0.05	0.1	13	0.17	7.4	2	30	26	13.7	3	<0.05	8
	31/05/2022	103	0.01	32	45	412	10.6	<0.05	0.1	15	0.18	7.6	3	32	24	13.2	4	<0.05	8
	01/06/2022	111	<0.01	34	56	450	10.9	<0.05	0.1	15	0.16	7.5	3	31	25	9.1	3	<0.05	<5
	02/06/2022	114	<0.01	35	54	450	10.2	<0.05	0.1	16	0.12	7.6	3	33	27	11.9	3	<0.05	<5
	03/06/2022	118	0.08	34	53	469	11.5	<0.05	0.1	16	0.08	7.9	2	34	29	12.4	3	<0.05	<5
	04/07/2022	26	<0.01	8	16	119	10.5	0.32	<0.1	5	0.34	7.0	3	11	6	15.1	5	<0.05	178
	05/07/2022	39	0.02	11	23	181	10.5	0.21	<0.1	6	0.41	7.5	3	16	12	14.0	5	<0.05	43
	06/07/2022	49	0.02	13	31	243	11.2	0.15	0.1	7	0.35	7.8	3	19	16	12.8	5	<0.05	64
	07/07/2022	56	<0.01	17	30	256	10.5	0.09	0.1	9	0.26	7.6	3	21	17	14.2	4	<0.05	38
	08/07/2022	67	<0.01	18	37	304	10.8	<0.05	0.1	9	0.30	7.8	2	26	16	14.2	5	<0.05	12
	09/07/2022	80	0.06	23	38	327	11.7	0.07	0.1	12	0.27	7.8	2	25	21	11.3	3	<0.05	15
	10/07/2022	47	0.02	18	34	243	11.6	0.10	<0.1	8	0.26	7.8	4	21	14	12.1	6	<0.05	181
	11/07/2022	68	0.02	20	37	320	10.8	0.06	0.1	10	0.25	7.9	2	25	20	14.2	3	<0.05	11
	12/07/2022	86	0.01	21	41	323	11.0	<0.05	0.1	10	0.24	7.5	2	27	22	14.2	3	<0.05	8
	13/07/2022	87	0.07	27	42	365	11.1	<0.05	0.1	12	0.22	7.6	2	28	21	13.4	10	<0.05	11
	14/07/2022	82	0.03	25	43	392	11.2	<0.05	0.1	12	0.19	7.8	2	28	24	12.6	3	<0.05	11
	15/07/2022	100	<0.01	30	57	416	12.0	<0.05	0.1	13	0.20	7.6	2	32	26	9.9	2	<0.05	10
	16/07/2022	99	0.01	28	54	424	11.4	<0.05	0.1	12	0.19	7.7	2	29	26	11.9	2	<0.05	8
	26/07/2022	79	<0.01	27	55	364	11.0	<0.05	0.1	12	0.16	7.9	2	31	24	13.7	3	<0.05	15
	27/07/2022	100	0.03	35	49	416	11.6	<0.05	0.1	16	0.17	7.8	3	35	26	1040	3	<0.05	9
	28/07/2022	105	<0.01	29	48	422	12.7	<0.05	0.1	13	0.14	8.0	2	33	26	14.0	3	<0.05	<5
	29/07/2022	107	<0.01	35	59	443	12.7	<0.05	0.1	15	0.09	8.0	3	33	28	11.6	2	<0.05	6
	09/08/2022	124	0.03	39	62	466	13.1	<0.05	0.1	17	0.02	8.5	3	41	32	14.8	2	<0.05	<5
	19/08/2022	127	0.04	45	64	528	13.6	<0.05	0.1	16	0.02	8.1	2	36	35	14.3	2	<0.05	<5
	05/10/2022	111	<0.01	31	45	424	10.3	<0.05	0.1	14	0.21	7.4	3	35	27	14.2	3	<0.05	7
	06/10/2022	34	0.03	9	14	138	11.2	0.28	<0.1	4	0.61	7.3	4	12	6	15.1	10	<0.05	294
	07/10/2022	74	<0.01	17	31	275	10.9	0.08	0.1	10	0.49	7.5	2	24	17	16.3	4	<0.05	30
	08/10/2022	86	0.05	22	34	314	10.0	<0.05	0.1	11	0.36	7.5	3	26	19	15.4	4	<0.05	24
	09/10/2022	44	0.01	12	21	187	10.8	0.19	<0.1	6	0.41	7.5	3	16	12	14.5	6	<0.05	75
	10/10/2022	76	<0.01	18	31	271	10.8	0.08	0.1	9	0.33	7.4	3	23	16	14.1	4	<0.05	26
	12/10/2022	82	<0.01	21	38	350	10.5	<0.05	0.1	10	0.19	7.1	2	24	22	17.2	3	<0.05	11
	13/10/2022	98	<0.01	25	40	373	10.5	<0.05	0.2	12	0.17	7.4	2	33	23	18.3	3	<0.05	<5
	24/10/2022	38	<0.01	10	16	131	9.99	0.36	<0.1	5	0.23	7.5	5	13	1	18.9	9	<0.05	394
	27/10/2022	74	<0.01	19	33	305	9.86	0.06	0.1	10	0.22	7.3	2	25	19	18.0	4	<0.05	19
	11/11/2022	134	0.02	38	61	504	9.41	<0.05	<0.1	16	<0.01	7.6	3	36	29	16.9	2	<0.05	<5
	02/02/2023	164	0.03	48	63	566	7.91	<0.05	0.1	17	0.05	7.5	4	38	31	25.2	3	<0.05	<5

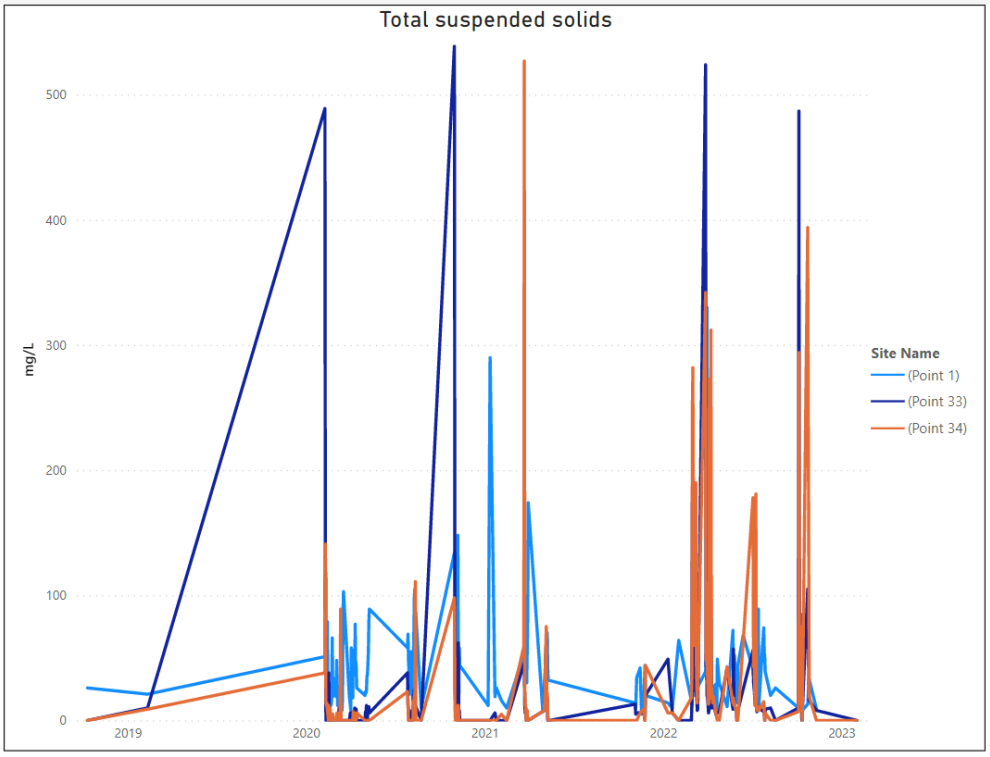

Alkalinity (as calcium carbonate)
mg/L
400
300
200
100
0
2019
2020
2021
2022
2023
Site Name
(Point 1)
(Point 33)
(Point 34)

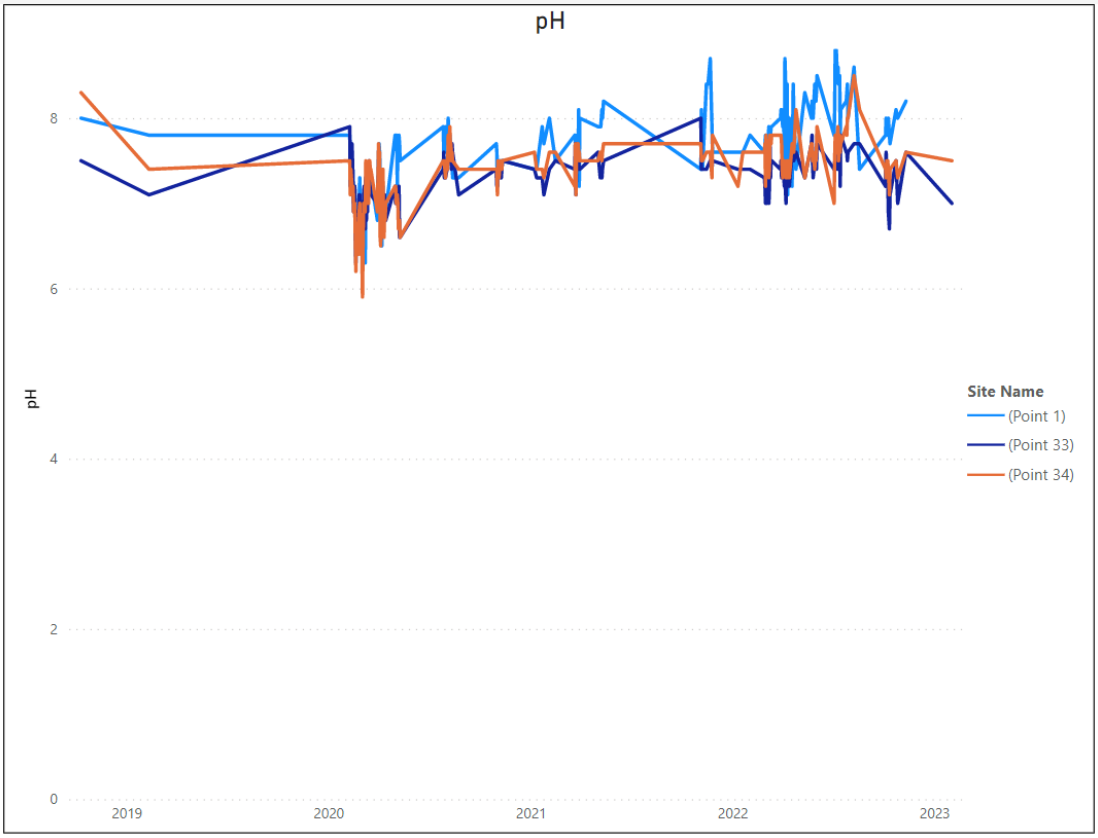

Fluoride
mg/kg
0.8
0.6
0.4
0.2
0.0
2019
2020
2021
2022
2023
Site Name
(Point 1)
(Point 33)
(Point 34)

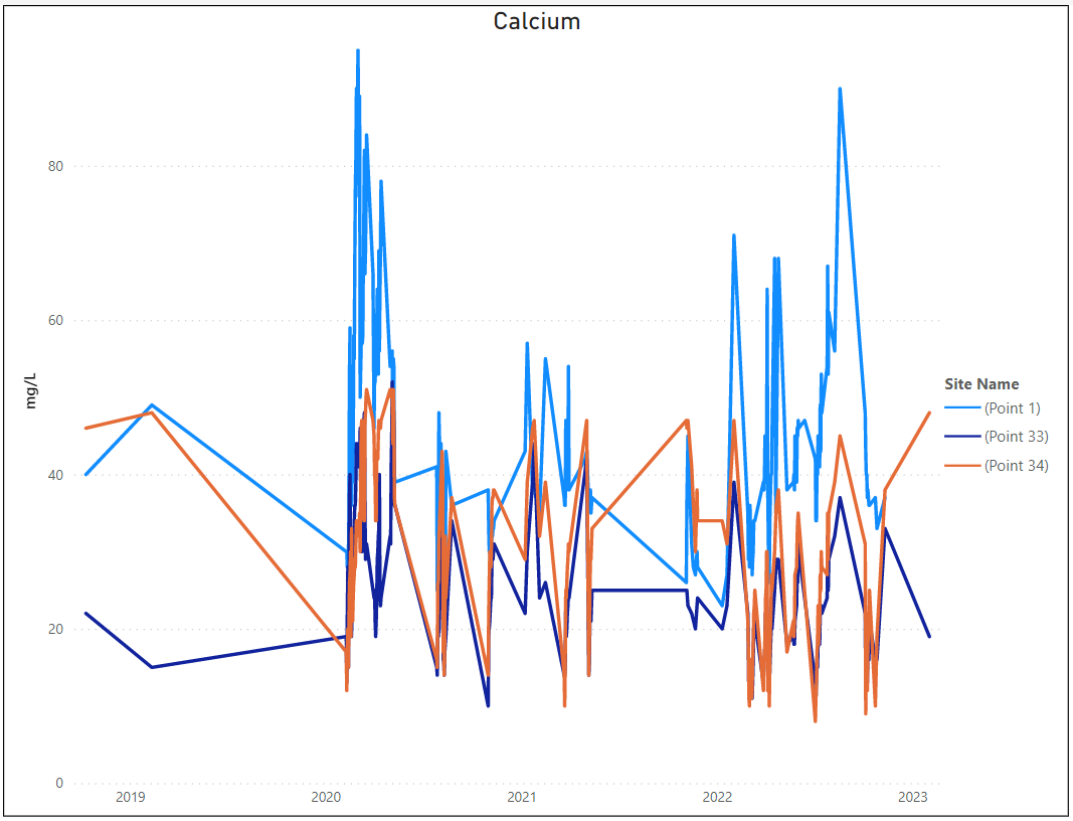

Total organic carbon
60
50
40
30
20
10
0
mg/L
2019
2020
2021
2022
2023
Site Name
(Point 1)
(Point 33)
(Point 34)

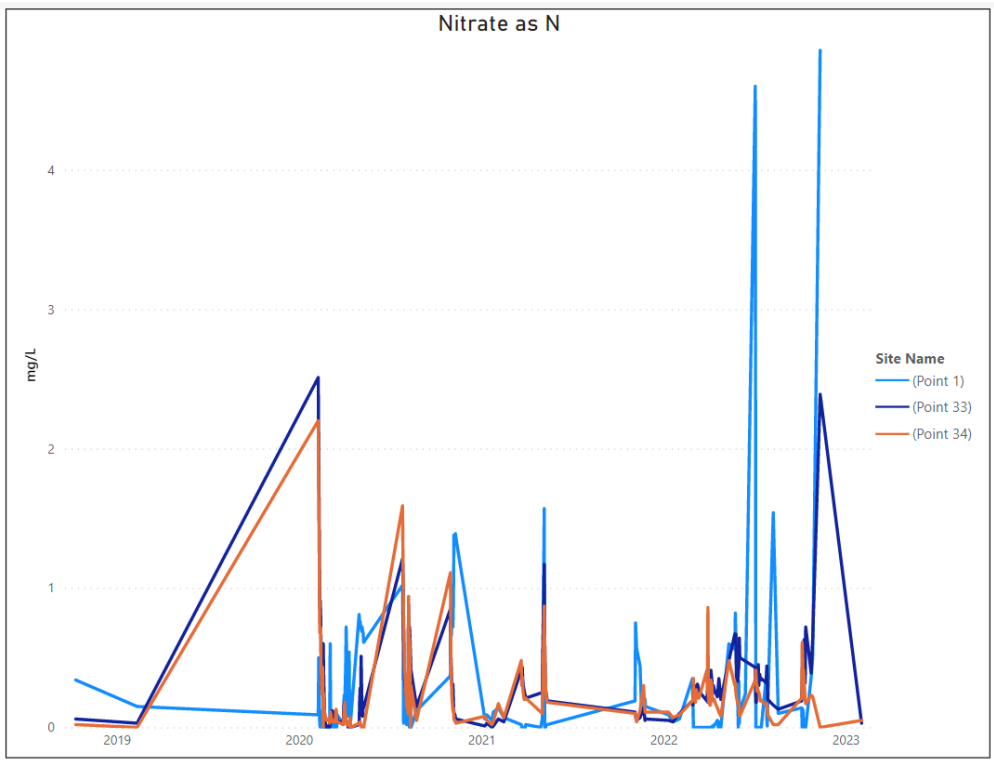

Ammonia
50
40
30
20
10
0
mg/L
2019
2020
2021
2022
2023
Site Name
(Point 1)
(Point 33)
(Point 34)

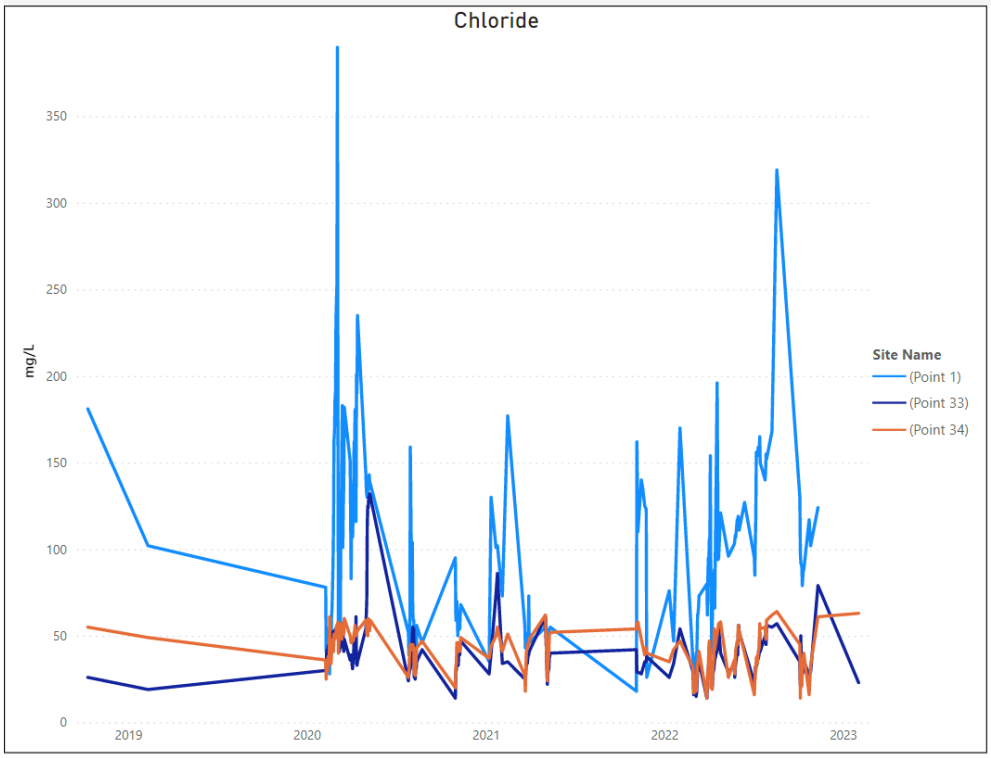

Magnesium
mg/L
40
30
20
10
0
2019
2020
2021
2022
2023
Site Name
(Point 1)
(Point 33)
(Point 34)

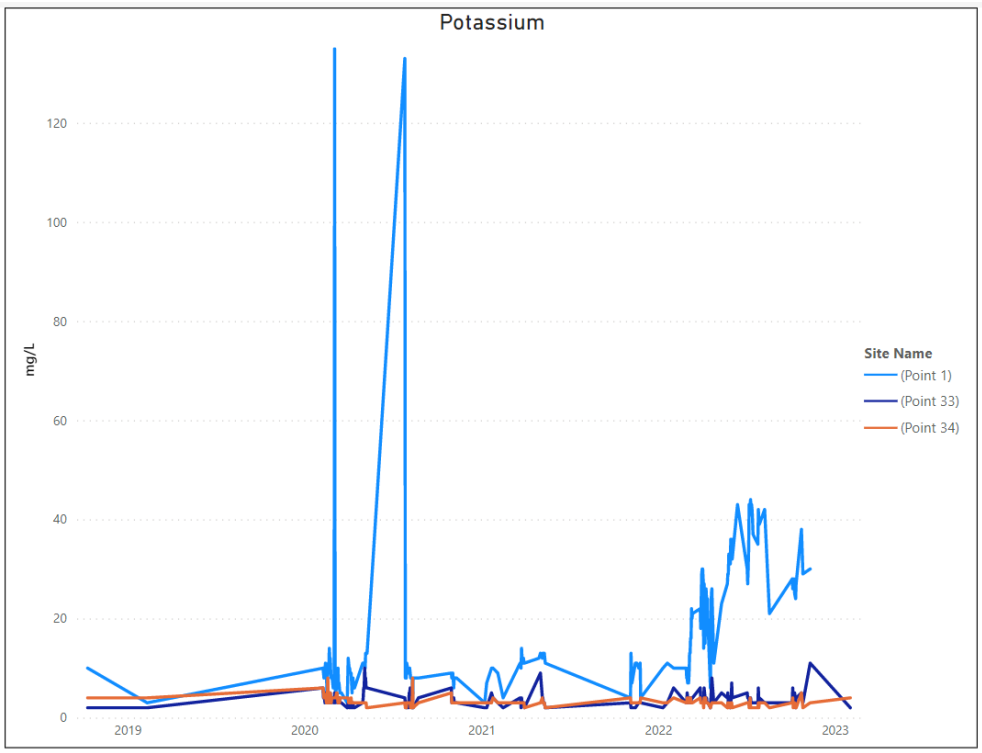

Total suspended solids
mg/L
500
400
300
200
100
0
2019
2020
2021
2022
2023
Site Name
(Point 1)
(Point 33)
(Point 34)

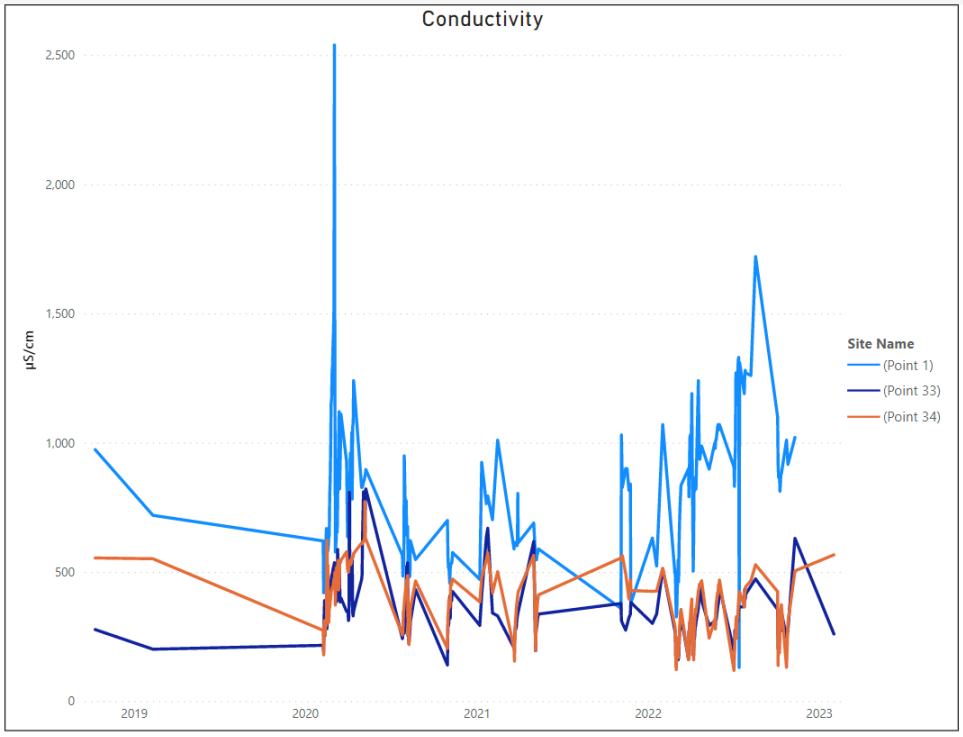

pH
8
6
4
2
0
pH
2019
2020
2021
2022
2023
Site Name
(Point 1)
(Point 33)
(Point 34)

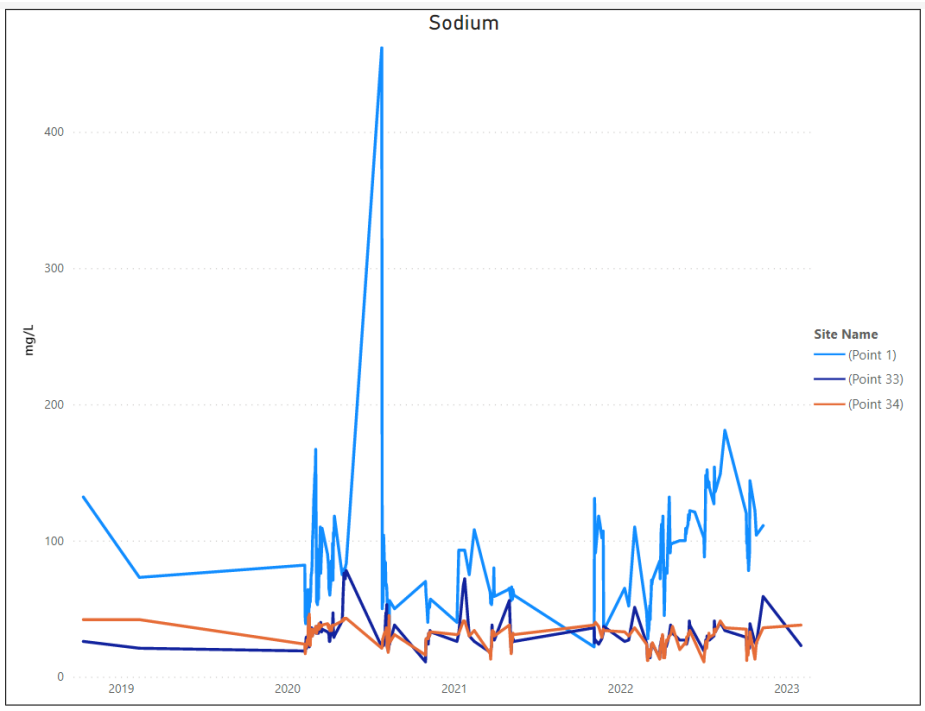

Calcium
80
60
40
20
0
mg/L
2019
2020
2021
2022
2023
Site Name
(Point 1)
(Point 33)
(Point 34)

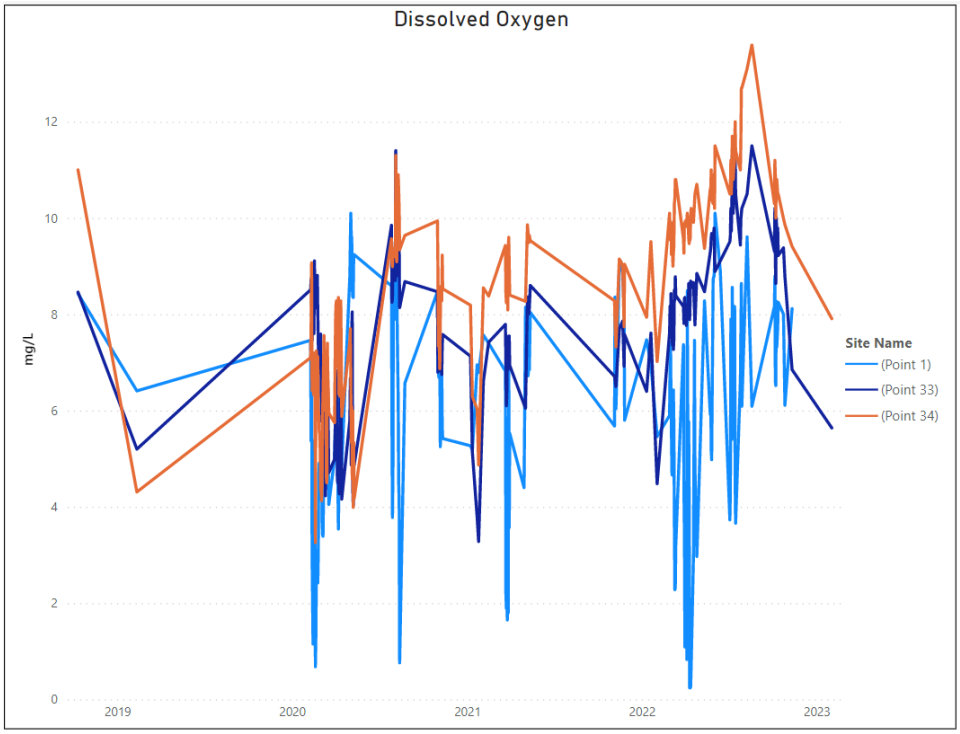

Nitrate as N
mg/L
4
3
2
1
0
2019
2020
2021
2022
2023
Site Name
(Point 1)
(Point 33)
(Point 34)

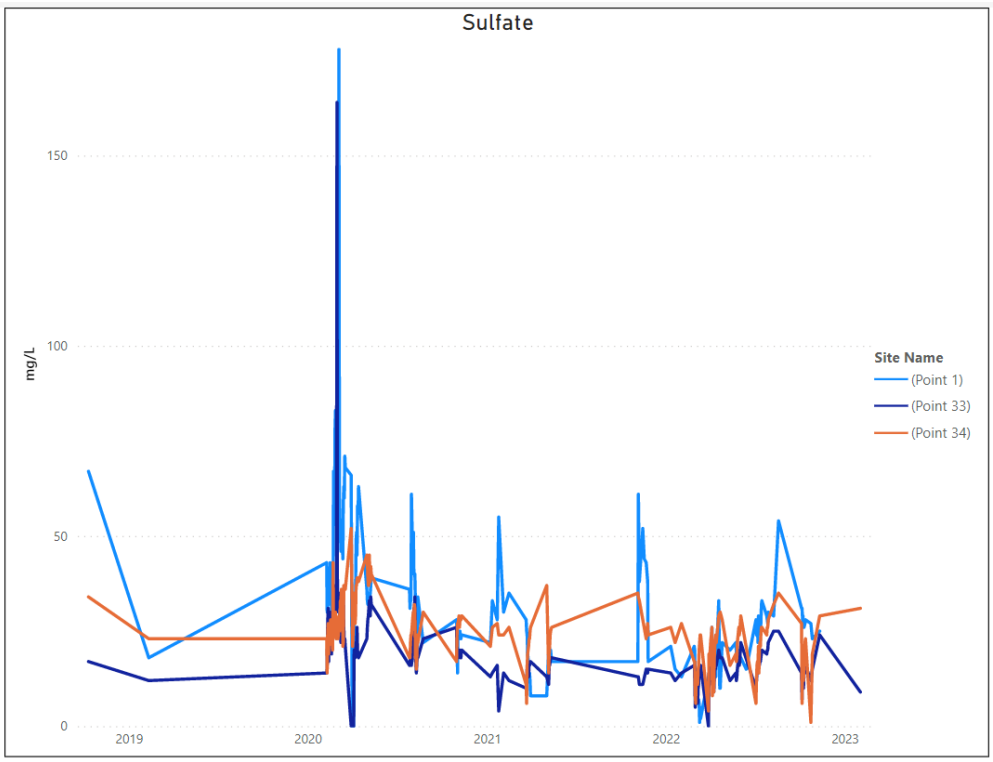

Chloride
mg/L
350
300
250
200
150
100
50
0
2019
2020
2021
2022
2023
Site Name
(Point 1)
(Point 33)
(Point 34)

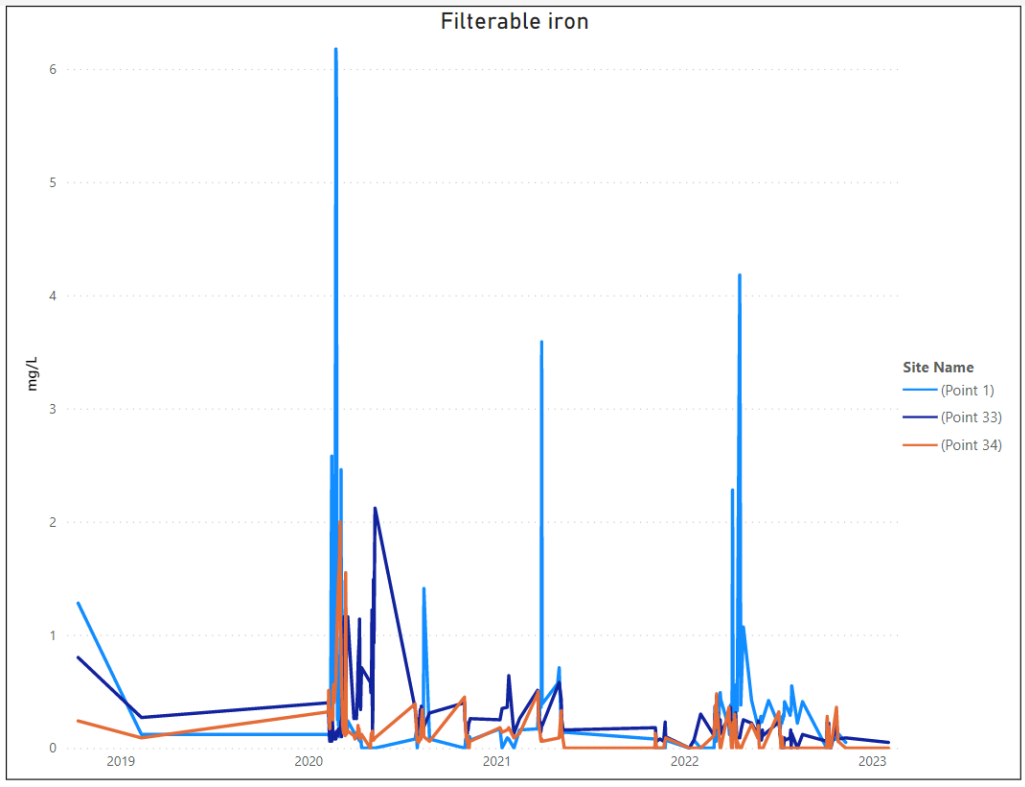

Potassium
120
100
80
60
40
20
0
mg/L
2019
2020
2021
2022
2023
Site Name
(Point 1)
(Point 33)
(Point 34)

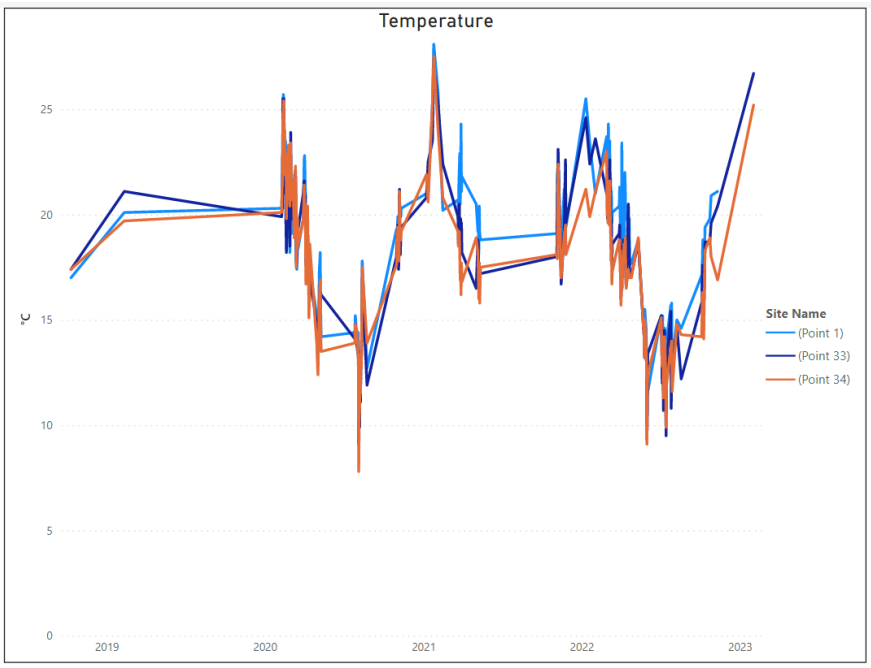

Conductivity
2,500
2,000
1,500
1,000
500
0
µS/cm
2019
2020
2021
2022
2023
Site Name
(Point 1)
(Point 33)
(Point 34)


Sodium
400
300
200
100
0
mg/L
2019
2020
2021
2022
2023
Site Name
(Point 1)
(Point 33)
(Point 34)


Dissolved Oxygen
12
10
8
6
4
2
0
mg/L
2019
2020
2021
2022
2023
Site Name
(Point 1)
(Point 33)
(Point 34)


Sulfate
150
100
50
0
mg/L
2019
2020
2021
2022
2023
Site Name
(Point 1)
(Point 33)
(Point 34)


Filterable iron
6
5
4
3
2
1
0
mg/L
2019
2020
2021
2022
2023
Site Name
(Point 1)
(Point 33)
(Point 34)

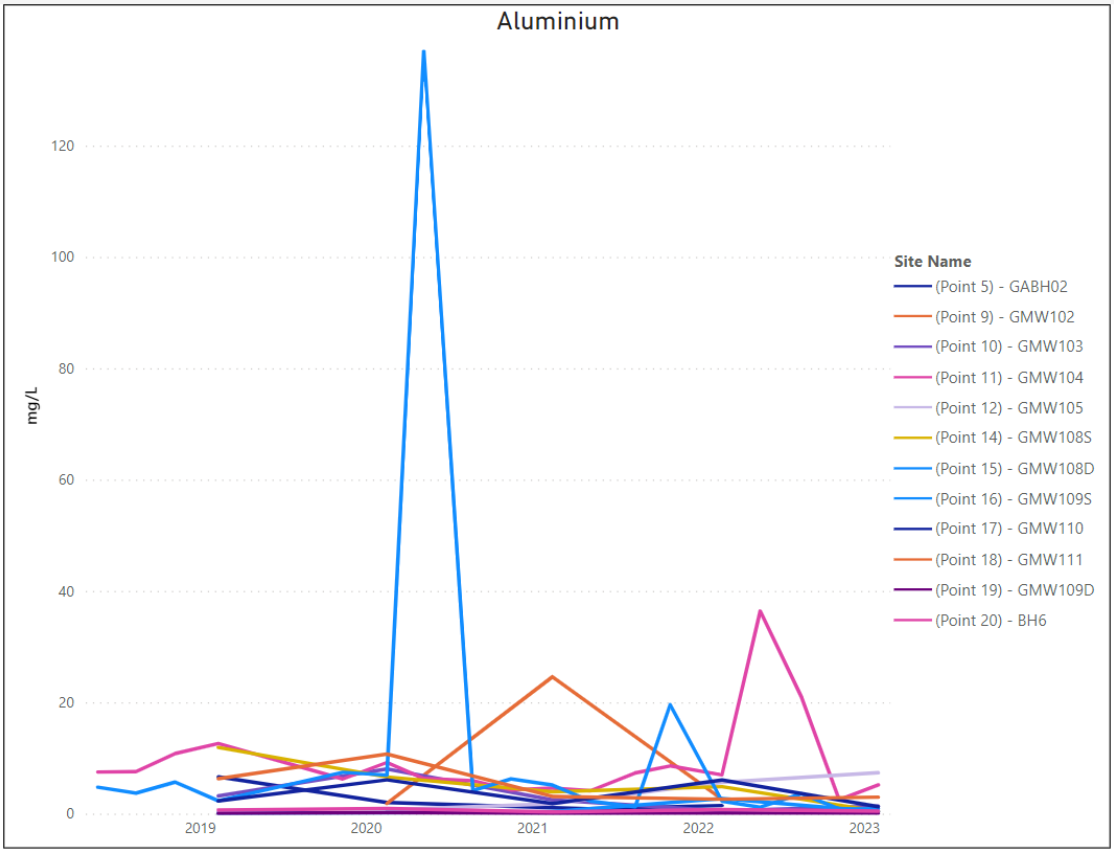

Temperature
°C
25
20
15
10
5
0
2019
2020
2021
2022
2023
Site Name
(Point 1)
(Point 33)
(Point 34)

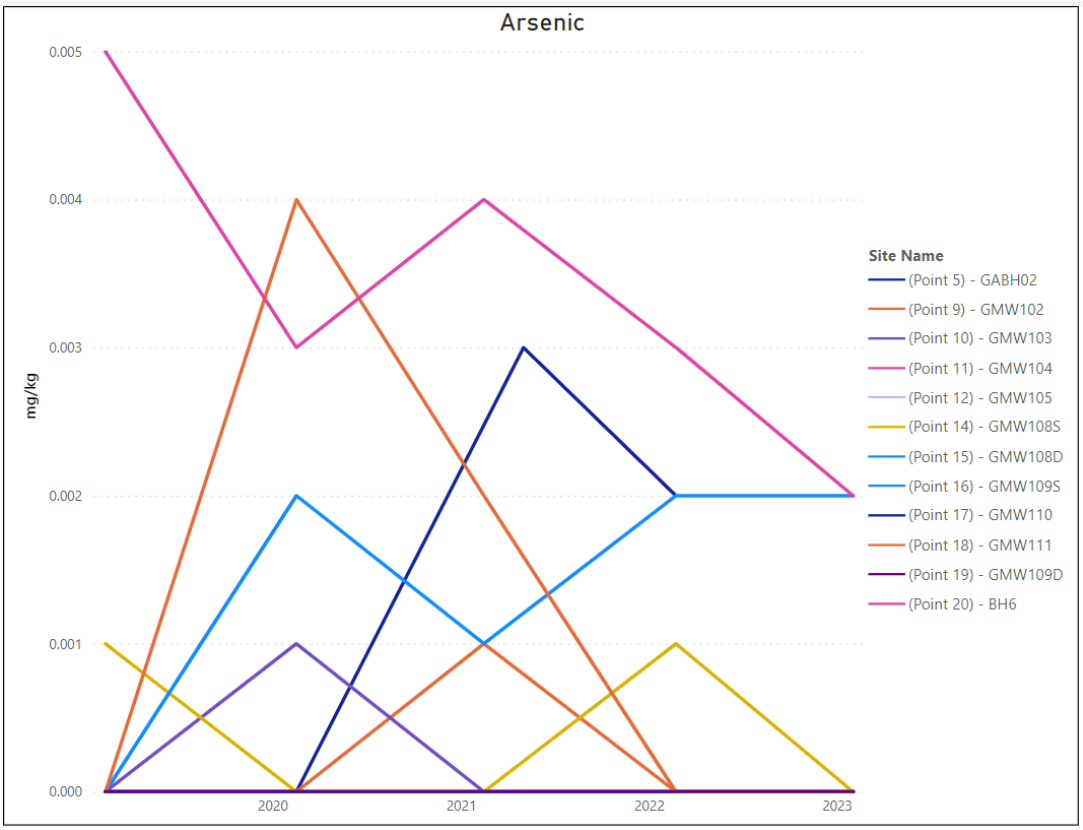
Appendix B: Groundwater

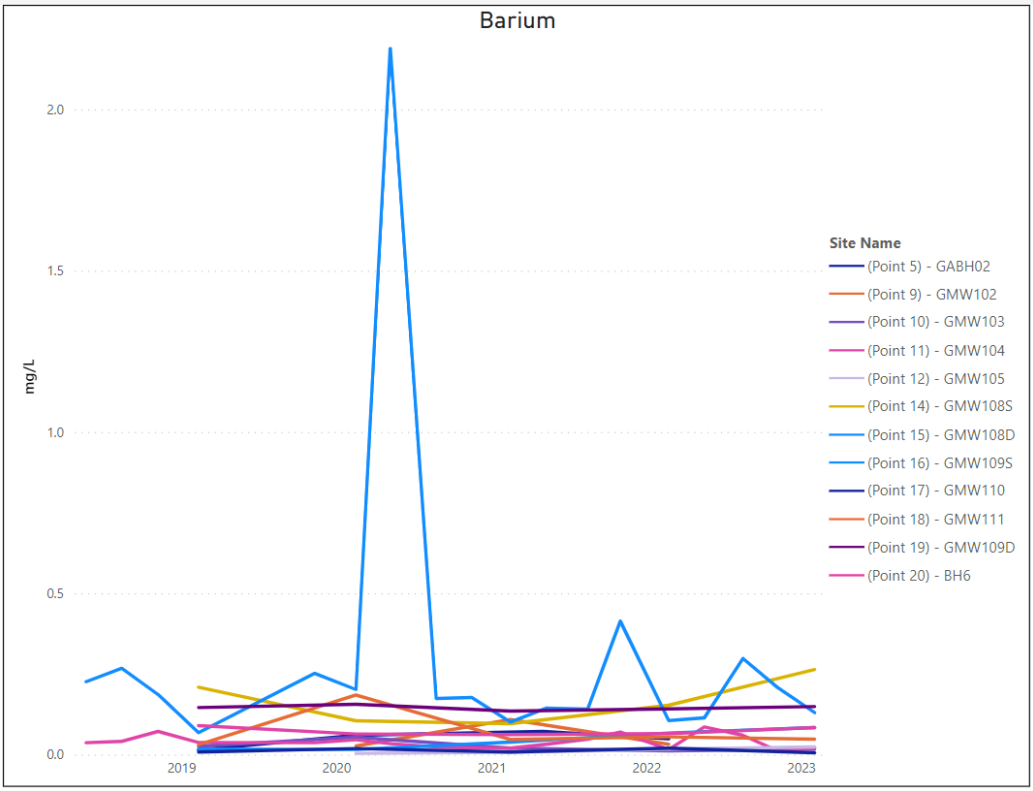
Results and Trends

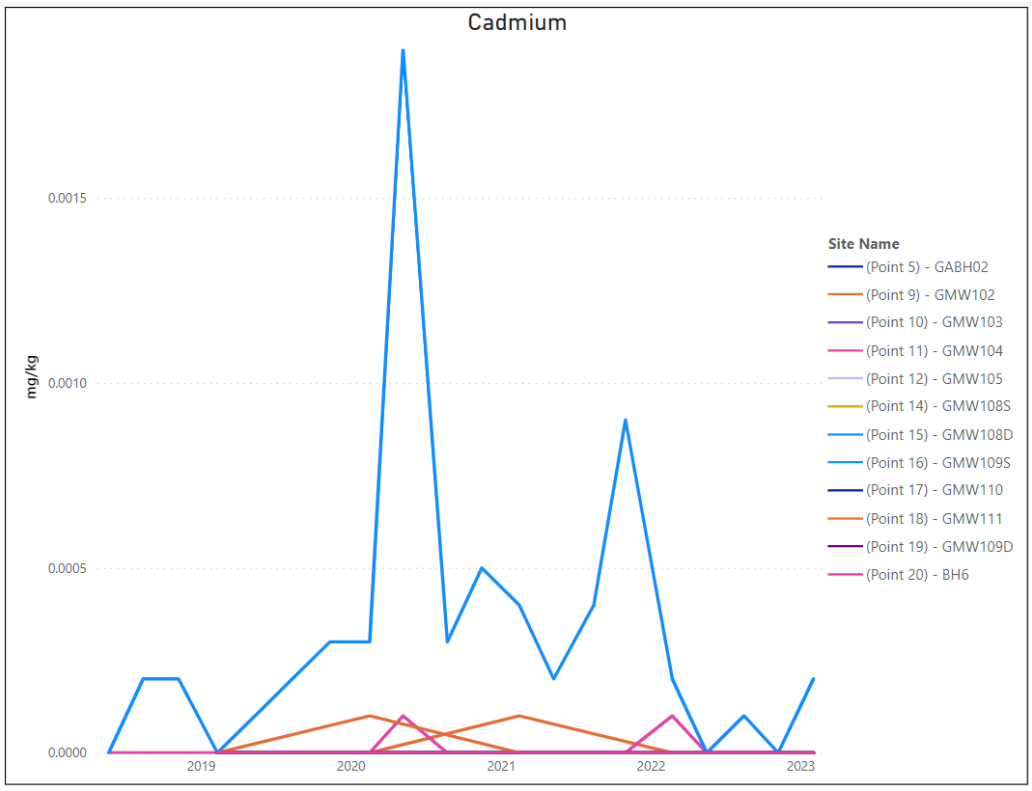
		Alkalinity (as calcium carbonate)	Aluminium	Ammonia	Arsenic	Barium	Benzene	Cadmium	Calcium	Chloride	Chromium (hexavelent)	Chromium (Total)	Cobalt	Conductivity	Copper	Depth	Ethylbenzene	Fluoride
Units		mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	Meters	µg/L	mg/L
Site Name	Sample Date																	
(Point 5) - GABH02	18/05/2022	1070		0.18					285	995				5070		3.99		
	17/08/2022	1100		0.16					322	1130				5090		4.12		
	08/11/2022	1220		0.19					295	1130				5180		4.00		
(Point 9) - GMW102	18/05/2022	94		0.06					15	13				235		2.37		
	17/08/2022	132		0.02					32	19				326		7.40		
	08/11/2022	116		0.01					24	12				267		5.34		
(Point 10) - GMW103	18/05/2022	556		<0.01					96	78				1410		5.33		
	17/08/2022	617		<0.01					127	120				1490		5.18		
	08/11/2022	601		0.02					102	74				1370		5.81		
	02/02/2023	561	1.36	<0.01	<0.001	0.017	<1	<0.0001	134	171	<0.01	0.002	0.002	1370	0.006	7.58	<2	0.4
(Point 11) - GMW104	18/05/2022	100	36.4	<0.01		0.086		<0.0001	18	70		0.018	0.020	463	0.050	5.66		
	17/08/2022	160	20.9	0.01		0.060		<0.0001	38	129		0.012	0.012	737	0.032	6.07		
	08/11/2022	144	2.50	<0.01		0.011		<0.0001	34	130		0.002	0.002	721	0.011	6.08		
	02/02/2023	325	5.19	0.02	<0.001	0.021	<1	<0.0001	56	99	<0.01	0.003	0.005	811	0.011	7.05	<2	0.7
(Point 12) - GMW105	18/05/2022	42		0.06					5	32				210		7.92		
	17/08/2022	34		0.01					9	54				302		8.86		
	08/11/2022	38		<0.01					7	41				235		8.68		
	02/02/2023	64	7.36	0.02	<0.001	0.024	<1	<0.0001	11	38	<0.01	0.003	0.003	200	0.013	10.60	<2	0.2
(Point 14) - GMW108S	18/05/2022	241		0.07					41	55				610		1.95		
	17/08/2022	241		0.04					38	127				772		2.09		
	08/11/2022	212		0.12					26	29				474		2.00		
	02/02/2023	406	0.43	0.09	<0.001	0.264	<1	<0.0001	80	524	<0.01	<0.001	0.008	2100	<0.001	2.22	<2	0.4
(Point 15) - GMW108D	18/05/2022	362		0.11					121	466				2310		1.33		
	17/08/2022	446		0.20					165	747				3080		1.51		
	08/11/2022	418		0.34					142	608				2600		1.48		
	02/02/2023	531	0.38	0.51	<0.001	0.084	<1	<0.0001	130	714	<0.01	<0.001	0.004	2790	<0.001	1.72	<2	0.5
(Point 16) - GMW109S	18/05/2022	391	1.17	0.39		0.114		<0.0001	115	124		0.001	0.027	1510	0.006	2.89		
	17/08/2022	1030	3.60	0.75		0.298		0.0001	319	261		0.004	0.030	2960	0.021	3.18		
	08/11/2022	765	0.85	0.72		0.207		<0.0001	222	175		0.001	0.025	2280	0.006	3.11		
	02/02/2023	227	0.88	0.37	0.002	0.130	<1	0.0002	63	138	<0.01	0.001	0.022	936	0.008	3.42	<2	0.1
(Point 17) - GMW110	18/05/2022	574		<0.01					189	809				4060		3.46		
	17/08/2022	646		<0.01					194	910				3940		3.68		
	08/11/2022	649		<0.01					205	924				4110		3.58		
	02/02/2023	643	1.26	0.01	<0.001	0.006	<1	<0.0001	168	892	<0.01	0.001	<0.001	3640	0.002	3.80	<2	0.5
(Point 18) - GMW111	18/05/2022	644		0.27					132	766				3950		5.85		
	17/08/2022	566		0.16					164	972				4290		5.98		
	08/11/2022	744		0.03					154	906				4350		5.98		
	02/02/2023	761	2.97	0.07	<0.001	0.048	<1	<0.0001	133	886	<0.01	0.002	0.002	3890	0.005	6.24	<2	0.5
(Point 19) - GMW109D	18/05/2022	221		0.08					103	496				2000		2.48		
	17/08/2022	241		0.06					115	559				1970		2.68		
	08/11/2022	239		0.10					112	554				2030		2.62		
	02/02/2023	210	0.06	0.11	<0.001	0.149	<1	<0.0001	86	539	<0.01	<0.001	0.002	1800	<0.001	2.94	<2	0.4
(Point 20) - BH6	18/05/2022	387		0.28					43	259				1590		0.97		
	17/08/2022	370		0.09					67	390				1850		1.12		
	08/11/2022	240		0.35					25	155				881		1.08		
	02/02/2023	425	0.47	0.28	0.002	0.084	<1	<0.0001	54	433	<0.01	0.001	0.007	1910	0.003	1.19	<2	0.6

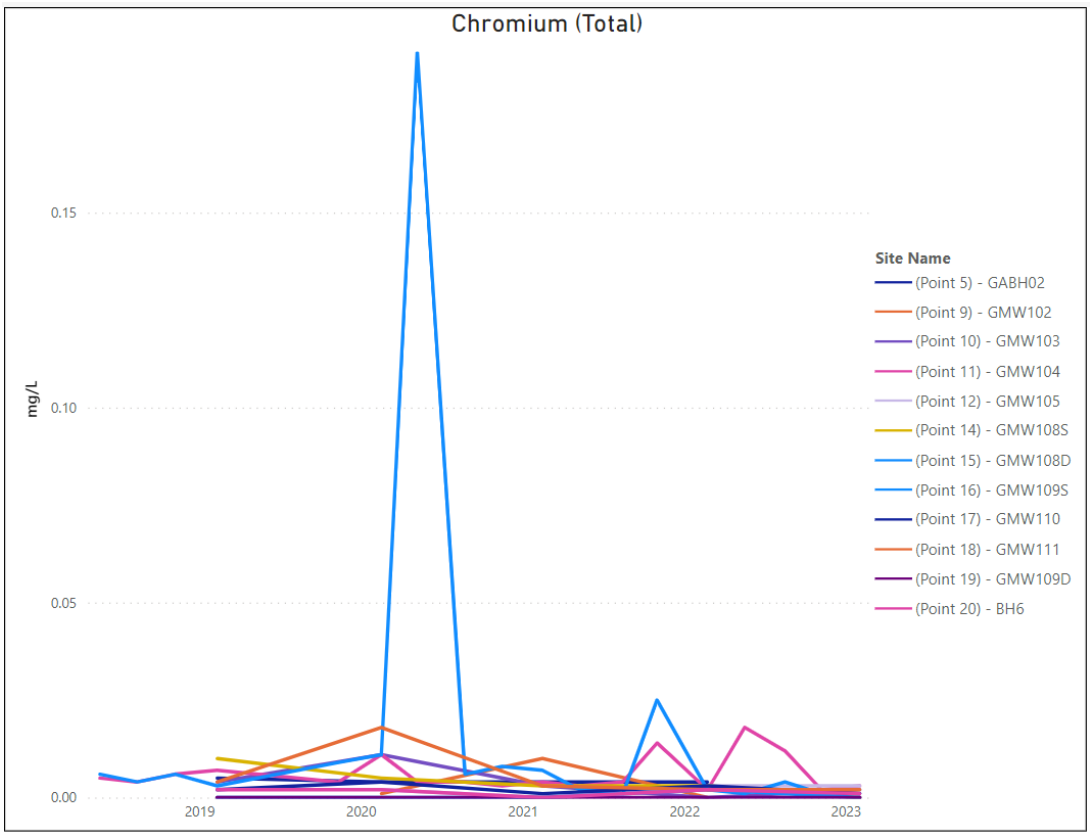
		Lead	Magnesium	Manganese	Mercury	Nitrate as N	Organophosphate Pesticides	pH	Polycyclic aromatic hydrocarbons	Potassium	Sodium	Sulfate	Toluene	Total Dissolved Solids	Total organic carbon	Total Petroleum Hydrocarbons	Total Phenolics	Xylene	Zinc
Units		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pH	µg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L
Site Name	Sample Date																		
(Point 5) - GABH02	18/05/2022		163					6.8		9	538	132		3000	9				
	17/08/2022		172					6.4		10	551	136		3130	10				
	08/11/2022		195					7.0		8	633	150		3030	9				
(Point 9) - GMW102	18/05/2022		5					6.6		<1	24	10		171	3				
	17/08/2022		8					6.5		<1	24	14		238	3				
	08/11/2022		6					6.7		<1	23	10		136	3				
(Point 10) - GMW103	18/05/2022		41					7.1		5	147	60		784	3				
	17/08/2022		46					7.2		<1	155	68		866	3				
	08/11/2022		46					7.7		6	166	62		761	3				
	02/02/2023	0.004	42	0.133	<0.0001	0.04	<0.5	7.1	<0.5	1	144	72	<2	912	5	<100	<0.05	<2	0.022
(Point 11) - GMW104	18/05/2022	0.023	11	1.17				7.3		<1	52	22		303	6				0.094
	17/08/2022	0.013	22	0.832				6.7		<1	74	34		410	4				0.045
	08/11/2022	0.002	22	0.254				7.0		<1	80	33		370	4				0.015
	02/02/2023	0.004	29	0.594	<0.0001	0.04	<0.5	7.6	<0.5	1	107	40	<2	608	4	<100	<0.05	<2	0.019
(Point 12) - GMW105	18/05/2022		2					6.1		<1	32	11		195	3				
	17/08/2022		4					5.9		<1	41	15		230	2				
	08/11/2022		3					6.0		<1	38	14		210	4				
	02/02/2023	0.004	5	0.141	<0.0001	1.17	<0.5	5.7	<0.5	<1	34	12	<2	286	2	<100	<0.05	<2	0.019
(Point 14) - GMW108S	18/05/2022		16					6.8		4	67	15		394	7				
	17/08/2022		20					6.6		3	115	32		488	5				
	08/11/2022		12					7.0		2	64	6		266	6				
	02/02/2023	<0.001	72	1.30	<0.0001	<0.01	<0.5	7.1	<0.5	2	318	144	<2	1350	<1	<100	<0.05	<2	<0.005
(Point 15) - GMW108D	18/05/2022		59					6.8		5	239	117		1340	5				
	17/08/2022		84					6.4		4	359	169		1750	3				
	08/11/2022		82					6.9		4	324	147		1450	8				
	02/02/2023	<0.001	92	1.61	<0.0001	0.04	<0.5	6.9	<0.5	3	409	196	<2	1700	6	<100	<0.05	<2	0.016
(Point 16) - GMW109S	18/05/2022	0.002	51	6.43				6.6		2	121	210		894	20				0.021
	17/08/2022	0.011	104	16.3				6.5		3	233	461		1940	73				0.053
	08/11/2022	0.003	92	11.7				6.9		2	207	317		1420	34				0.024
	02/02/2023	0.007	39	4.32	<0.0001	<0.01	<0.5	6.8	<0.5	1	89	123	<2	519	8	<100	<0.05	<2	0.047
(Point 17) - GMW110	18/05/2022		133					6.8		2	432	303		2440	4				
	17/08/2022		132					6.4		2	463	306		2380	2				
	08/11/2022		168					6.6		2	519	335		2440	2				
	02/02/2023	<0.001	155	0.057	<0.0001	3.98	<0.5	6.9	<0.5	1	476	347	<2	2750	6	<100	<0.05	<2	0.006
(Point 18) - GMW111	18/05/2022		109					7.1		2	514	226		2230	4				
	17/08/2022		128					6.6		2	582	354		2440	9				
	08/11/2022		149					6.9		2	662	365		2430	6				
	02/02/2023	0.003	134	1.21	<0.0001	<0.01	<0.5	7.1	<0.5	2	590	409	<2	2830	10	<100	<0.05	<2	0.018
(Point 19) - GMW109D	18/05/2022		51					6.9		1	188	25		1300	1				
	17/08/2022		52					6.6		2	194	25		1130	<1				
	08/11/2022		58					6.8		1	218	24		1200	<1				
	02/02/2023	<0.001	52	0.760	<0.0001	0.03	<0.5	7.0	<0.5	1	192	24	<2	1610	2	<100	<0.05	<2	<0.005
(Point 20) - BH6	18/05/2022		30					7.0		2	226	22		863	18				
	17/08/2022		42					6.6		2	267	43		1060	6				
	08/11/2022		16					7.0		2	158	11		452	16				
	02/02/2023	0.002	48	1.31	<0.0001	0.11	<0.5	7.0	<0.5	2	321	44	<2	1340	15	<100	<0.05	<2	0.010

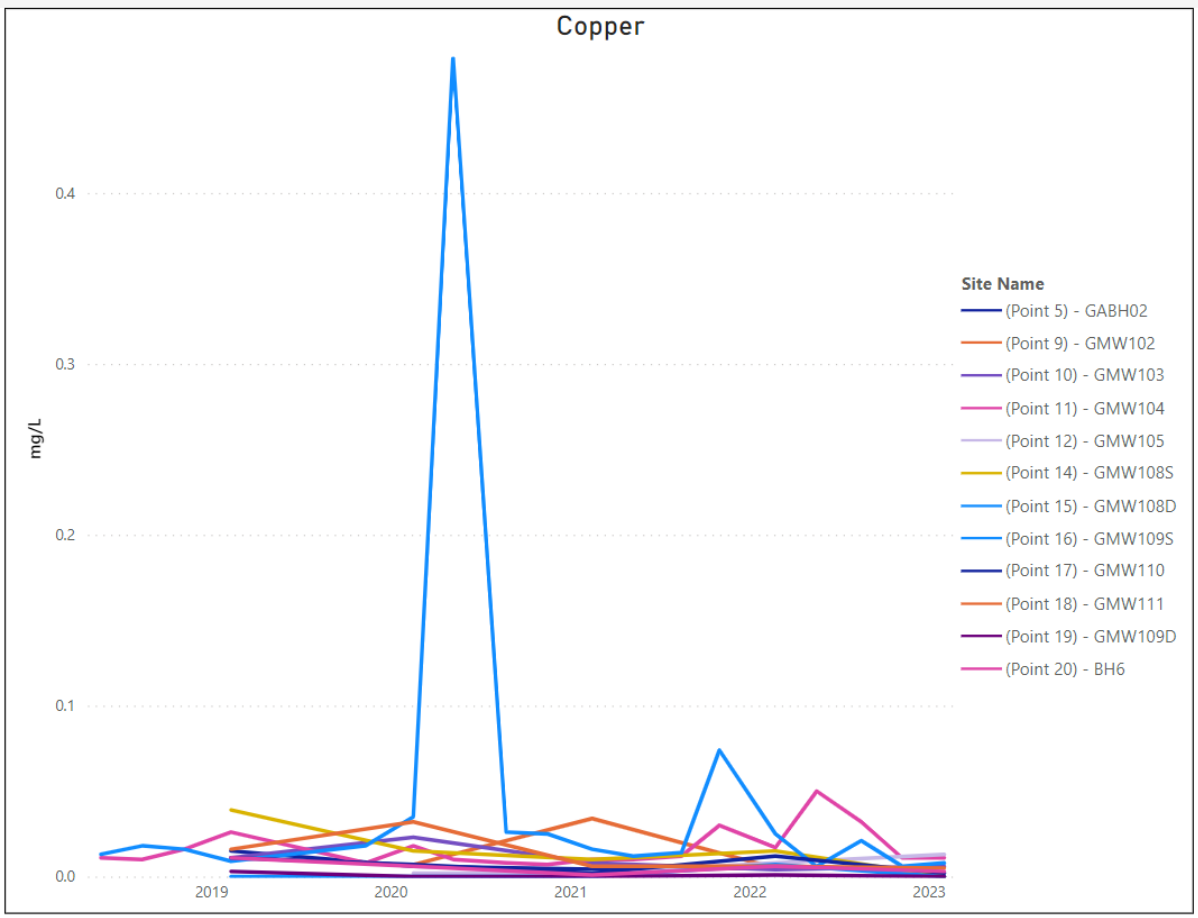

Aluminium
120
100
80
60
40
20
0
mg/L
2019
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

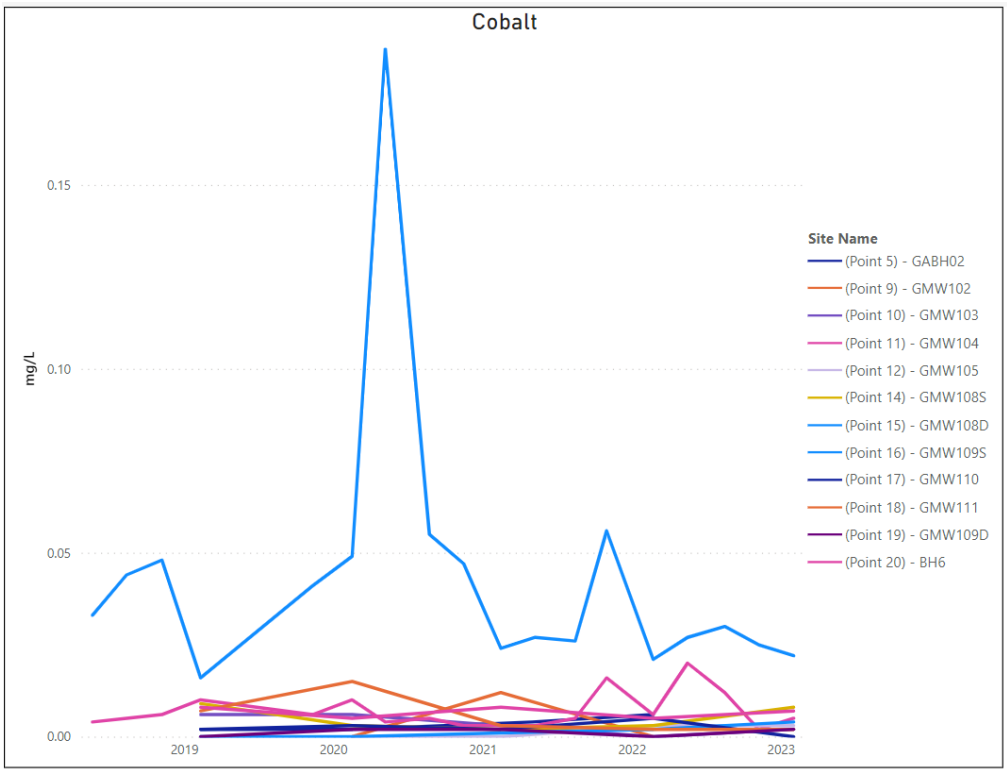

Arsenic
0.005
0.004
0.003
0.002
0.001
0.000
mg/kg
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

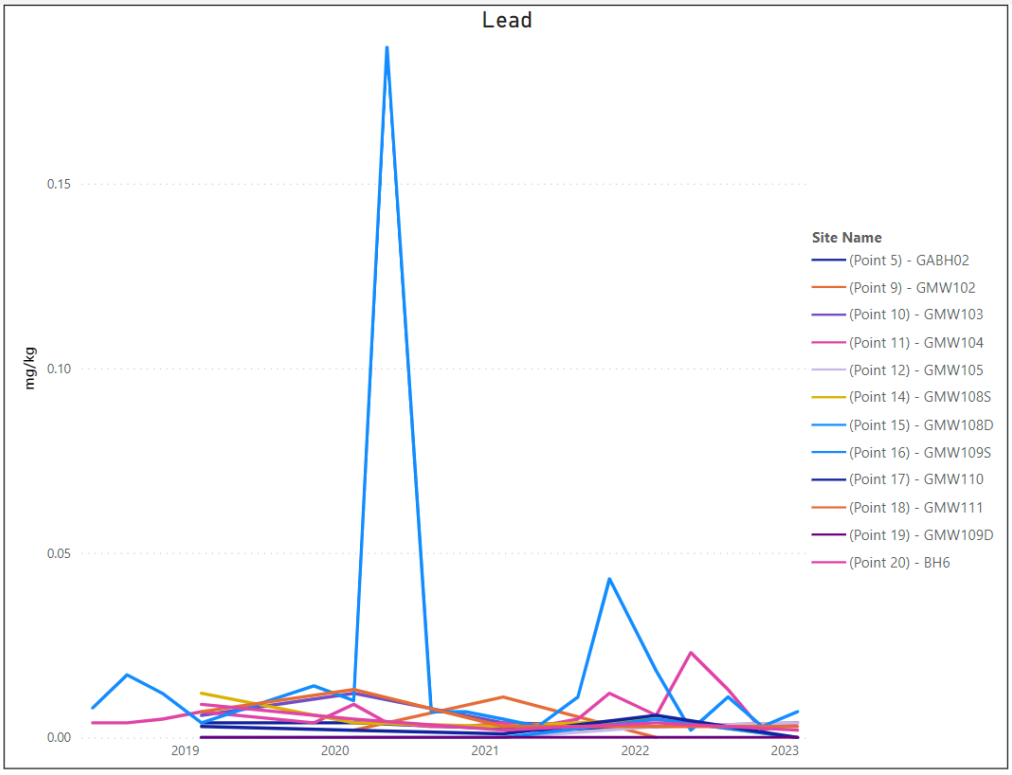

Barium
mg/L
2.0
1.5
1.0
0.5
0.0
2019
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

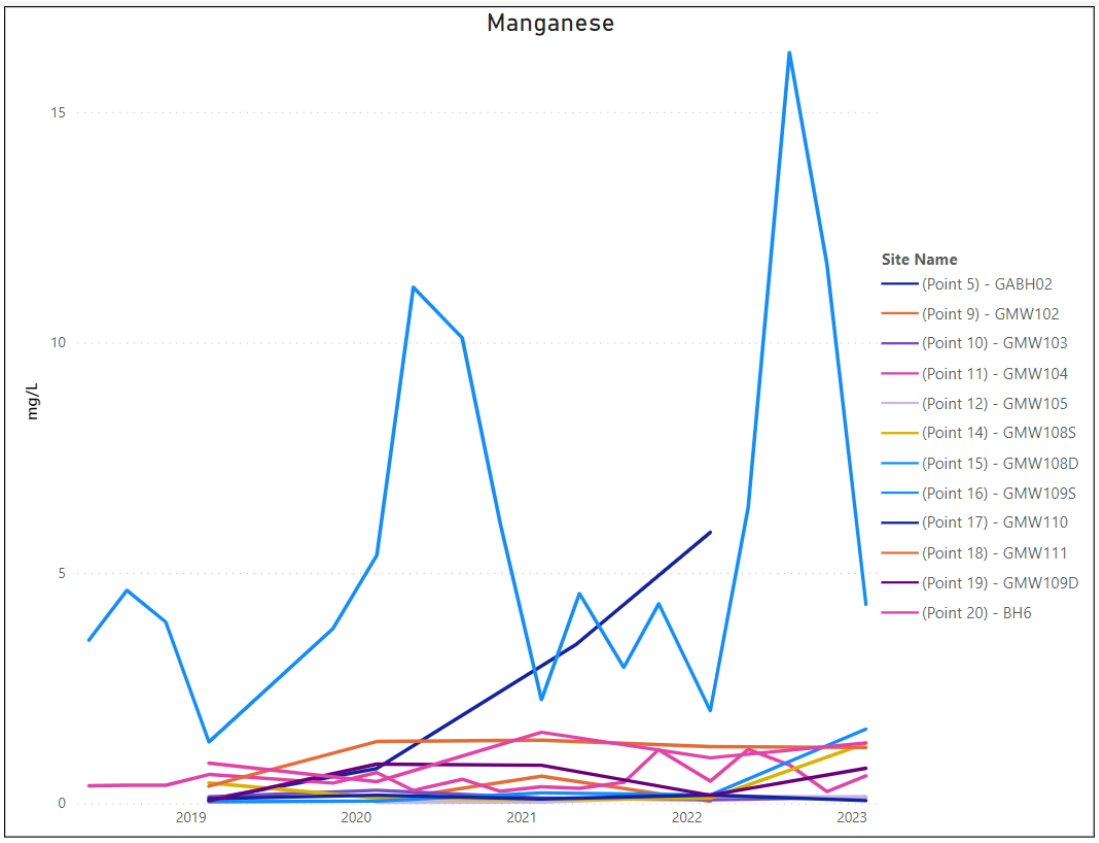

Cadmium
mg/kg
0.0015
0.0010
0.0005
0.0000
2019
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

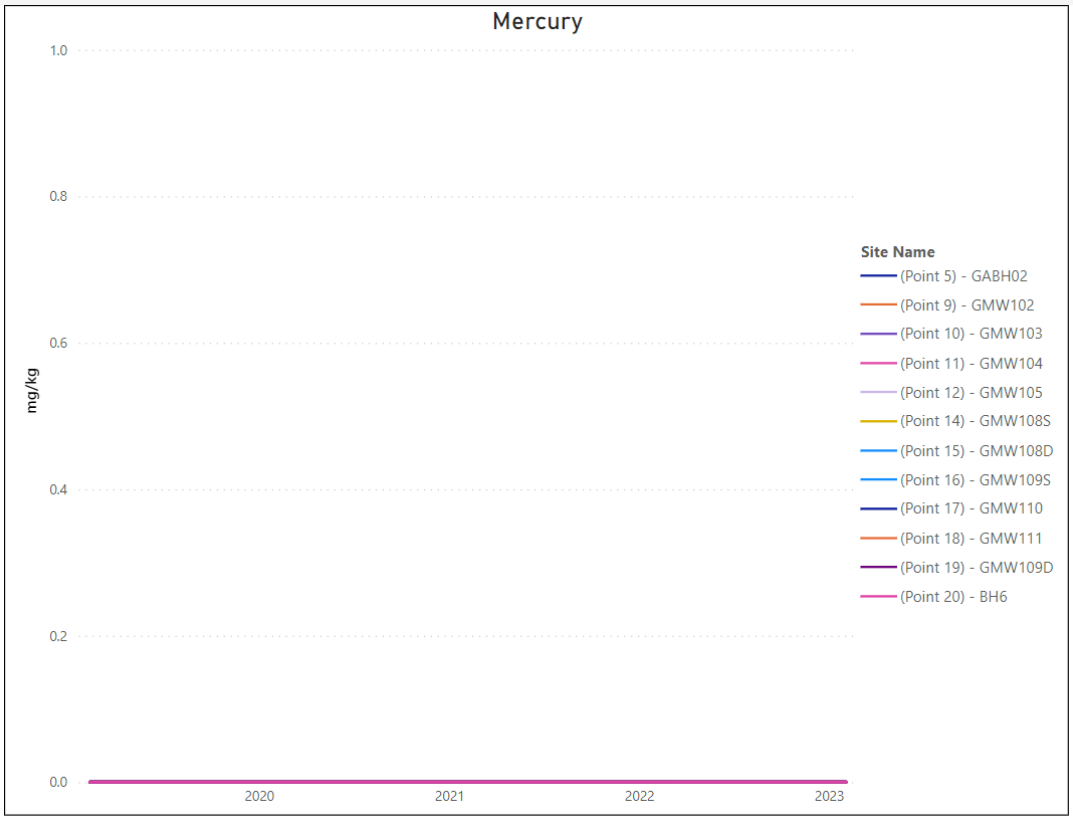

Chromium (Total)
mg/L
0.15
0.10
0.05
0.00
2019
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

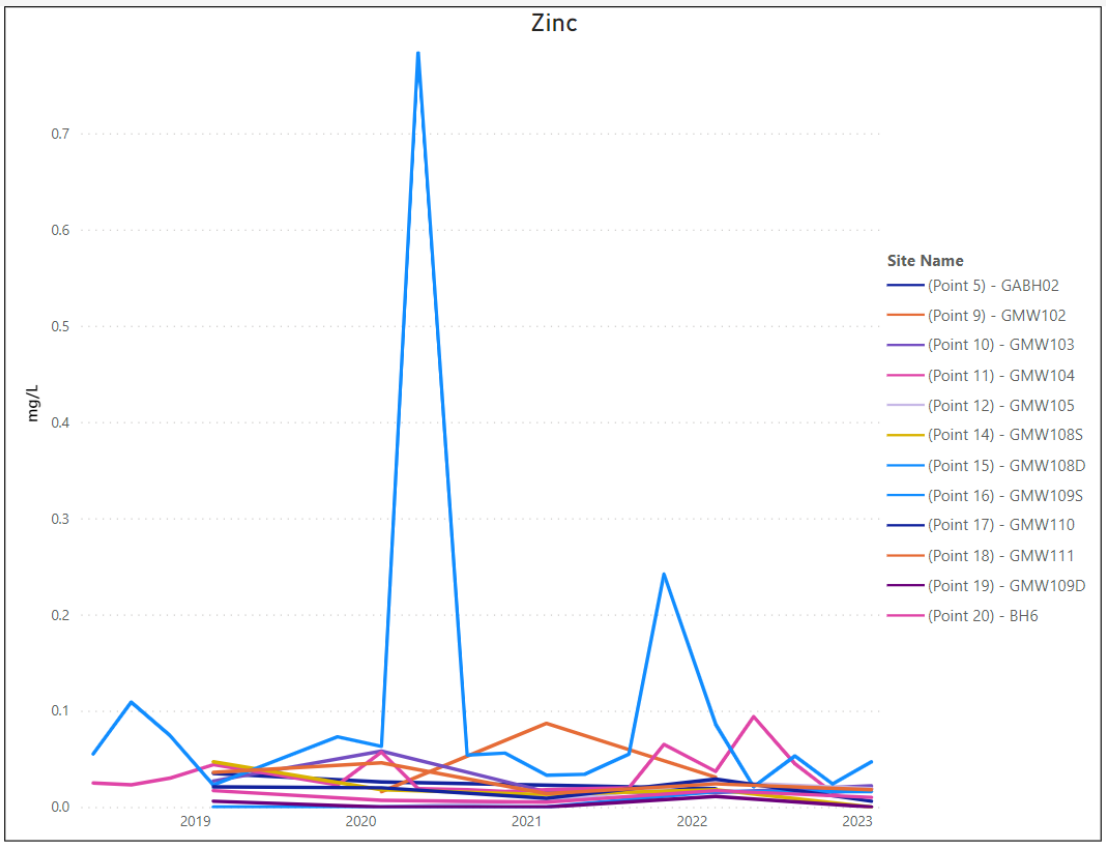

Copper
mg/L
0.4
0.3
0.2
0.1
0.0
2019
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

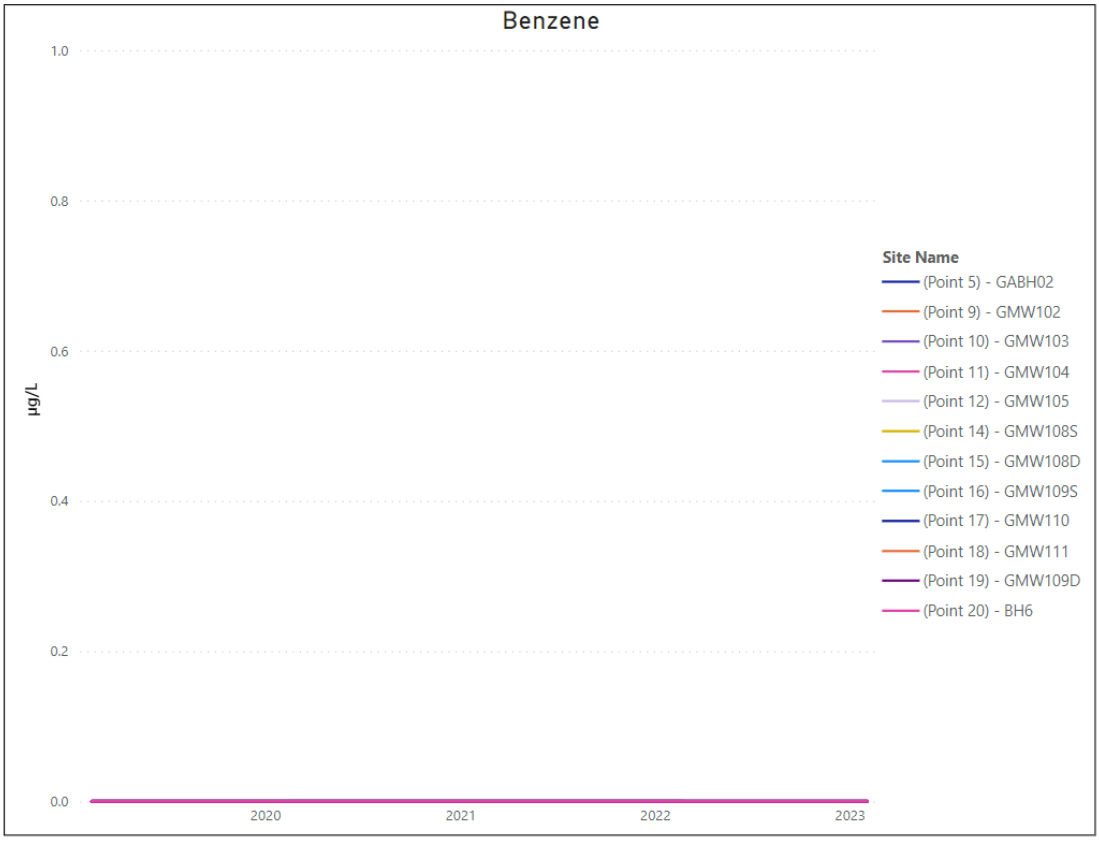

Cobalt
mg/L
0.15
0.10
0.05
0.00
2019
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

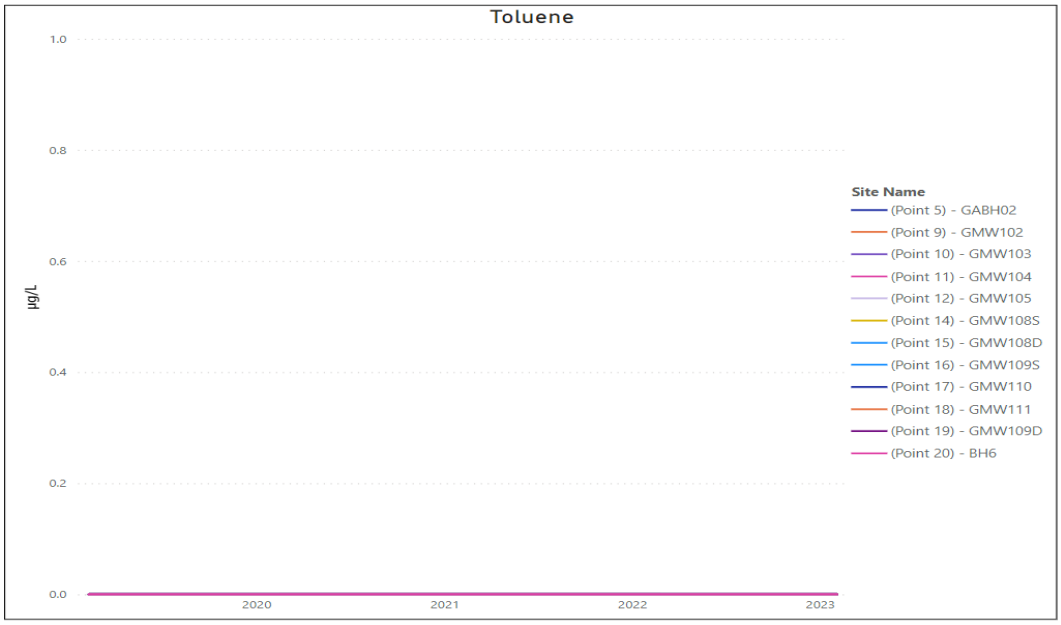

Lead
mg/kg
0.15
0.10
0.05
0.00
2019
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

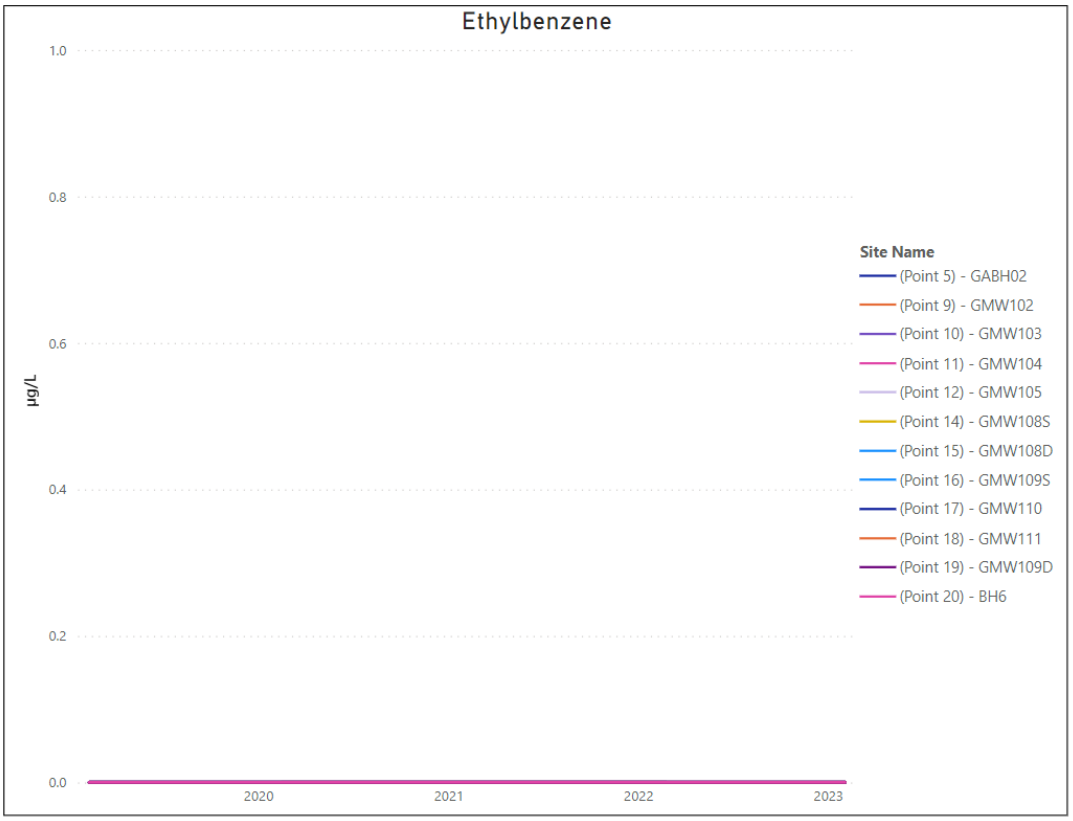

Manganese
15
10
5
0
mg/L
2019
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

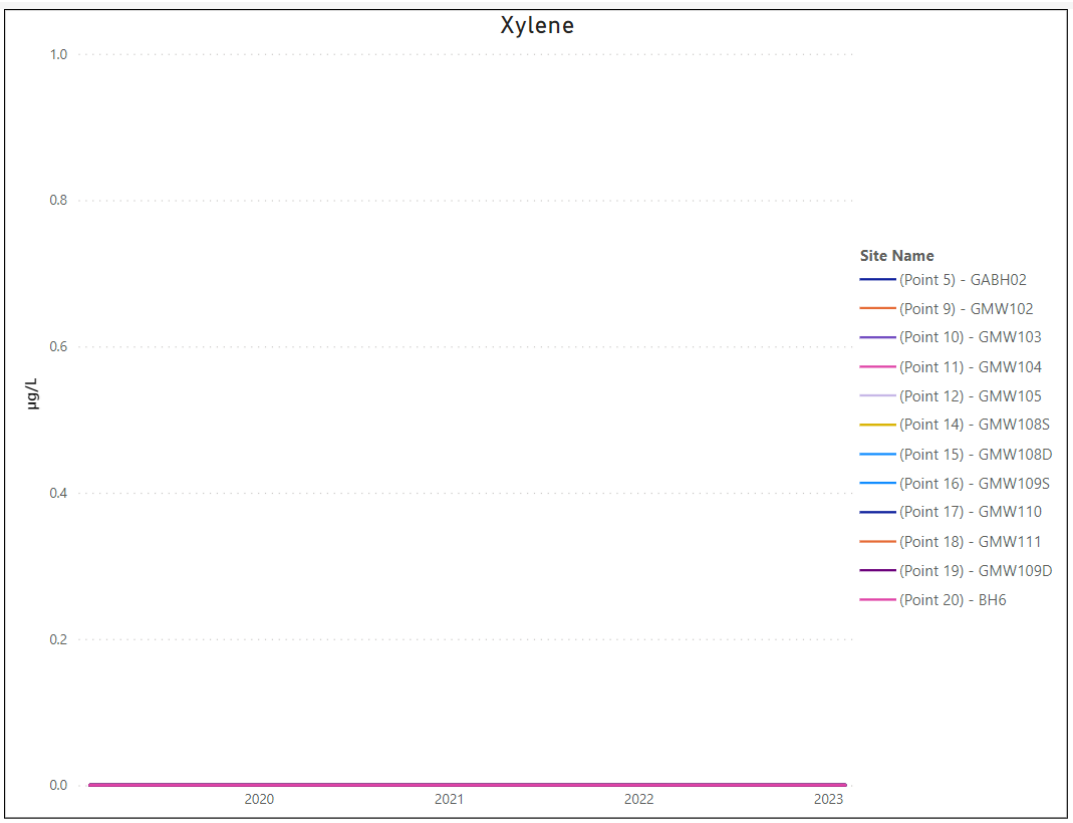

Mercury
1.0
0.8
0.6
0.4
0.2
0.0
mg/kg
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

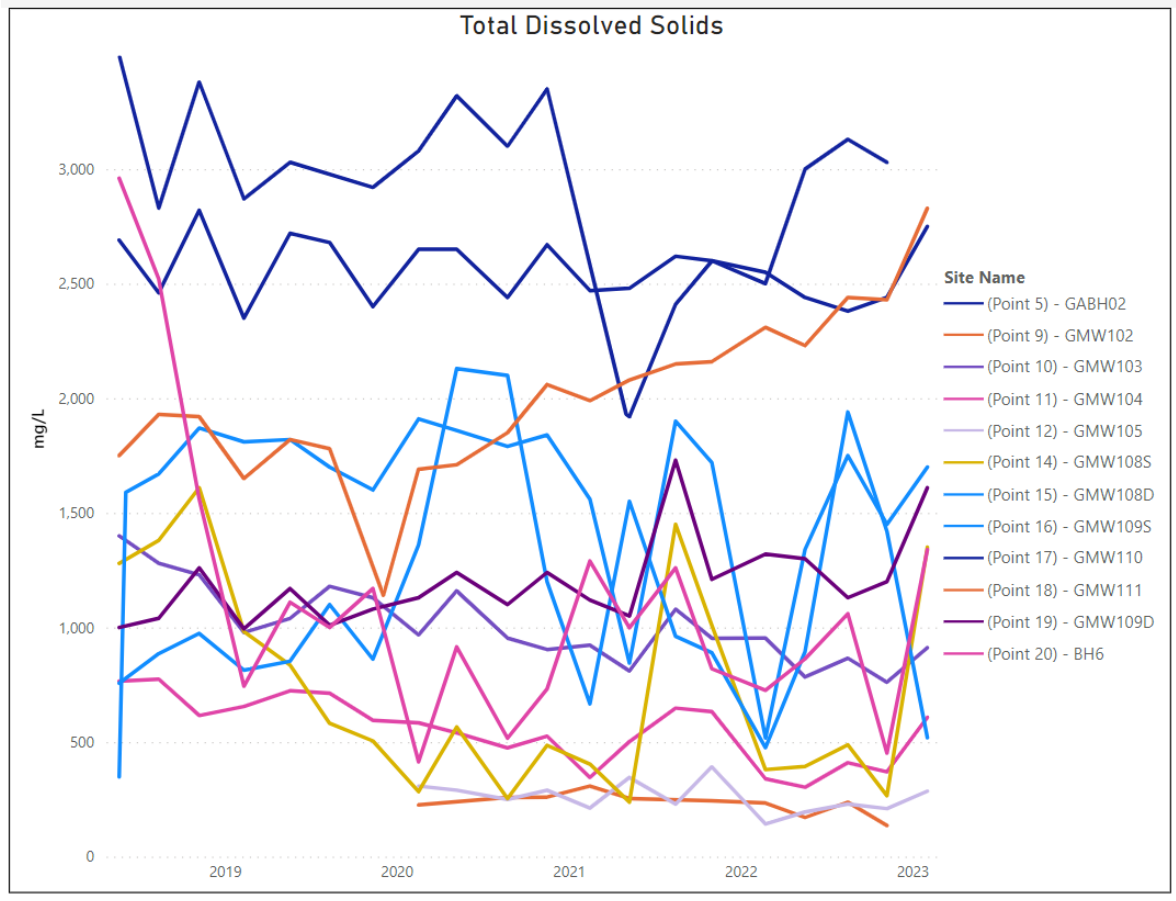

Zinc
mg/L
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
2019
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

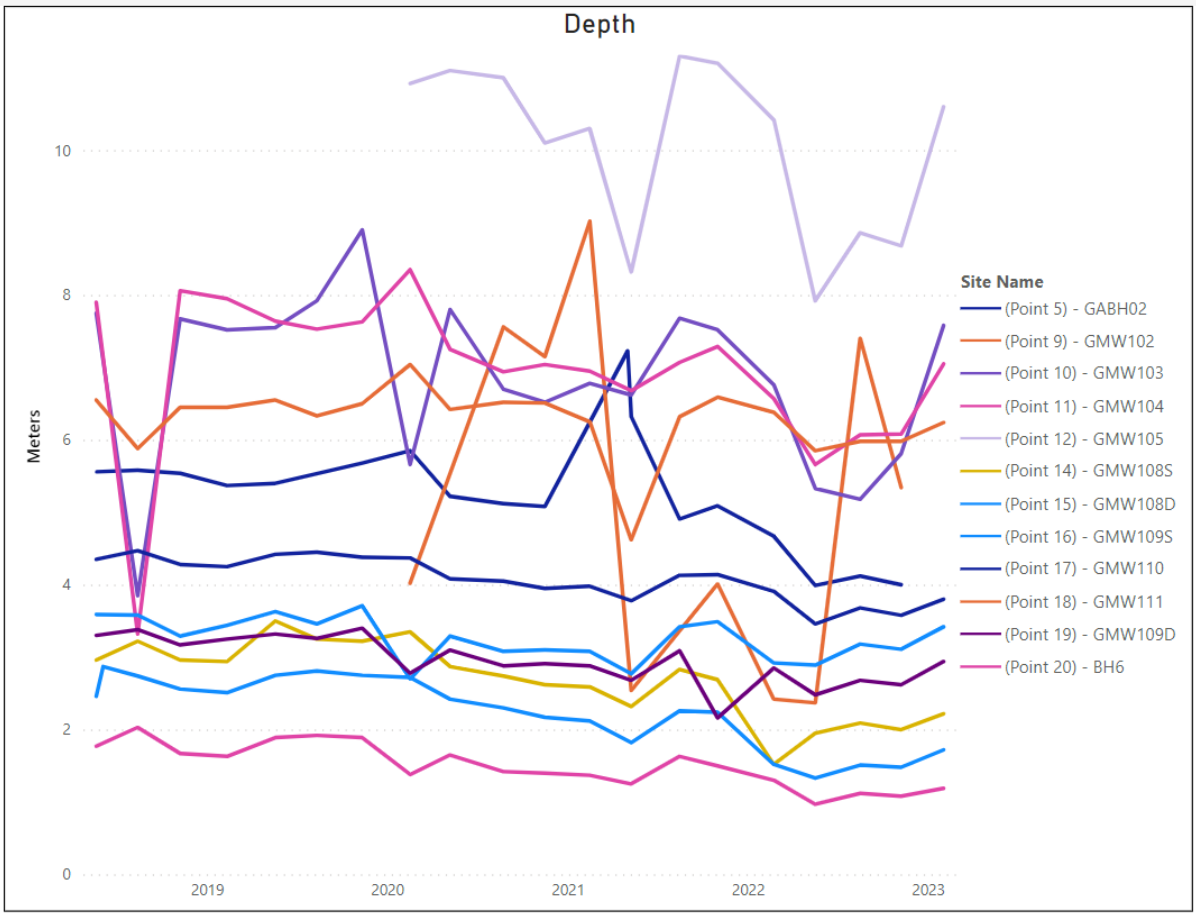

Benzene
µg/L
1.0
0.8
0.6
0.4
0.2
0.0
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

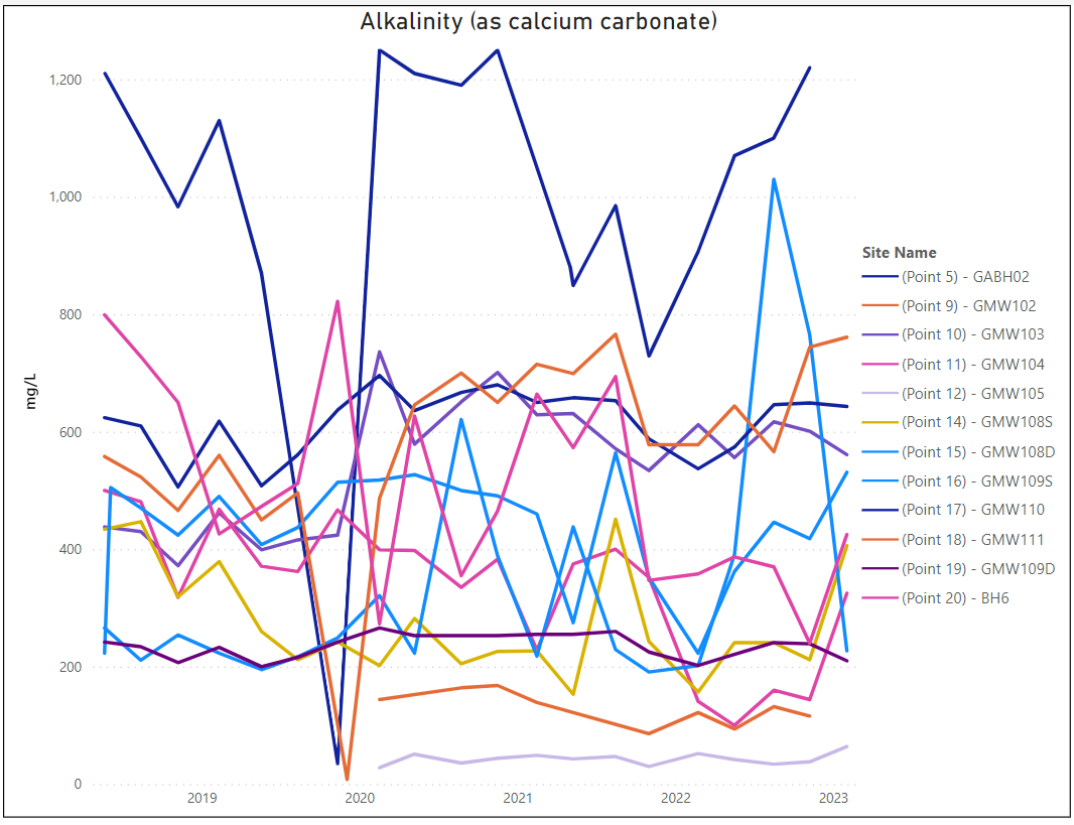

Toluene
1.0
0.8
0.6
0.4
0.2
0.0
µg/L
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

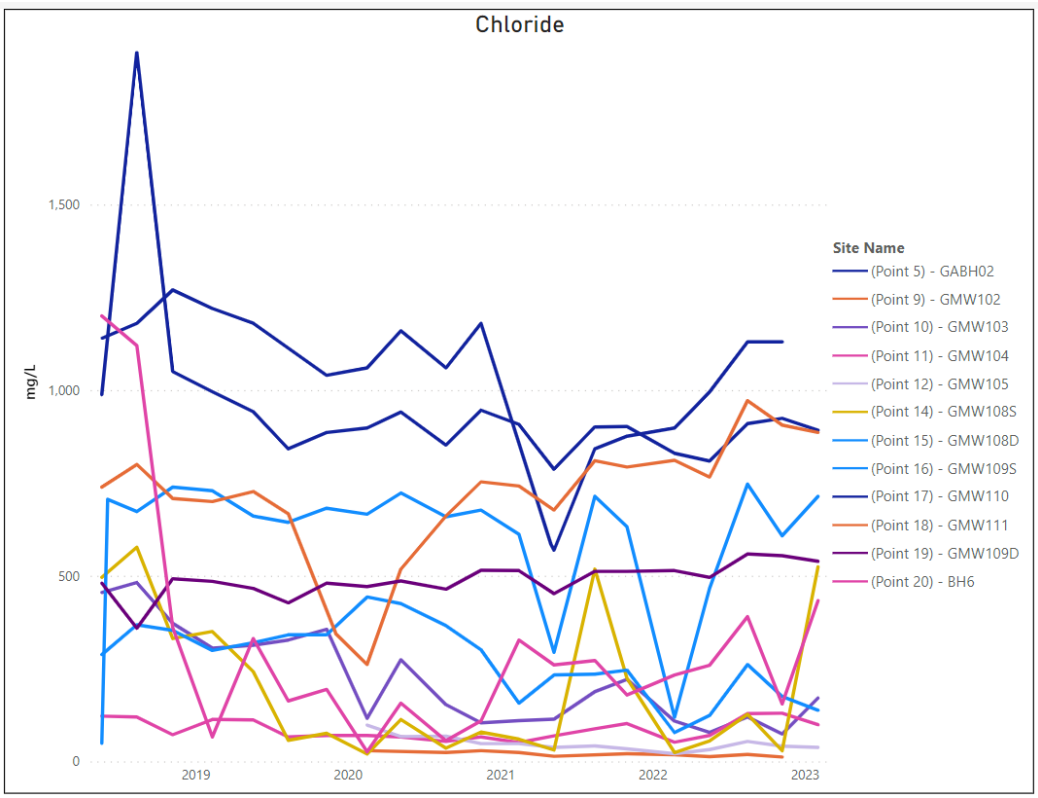

Ethylbenzene
1.0
0.8
0.6
0.4
0.2
0.0
µg/L
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

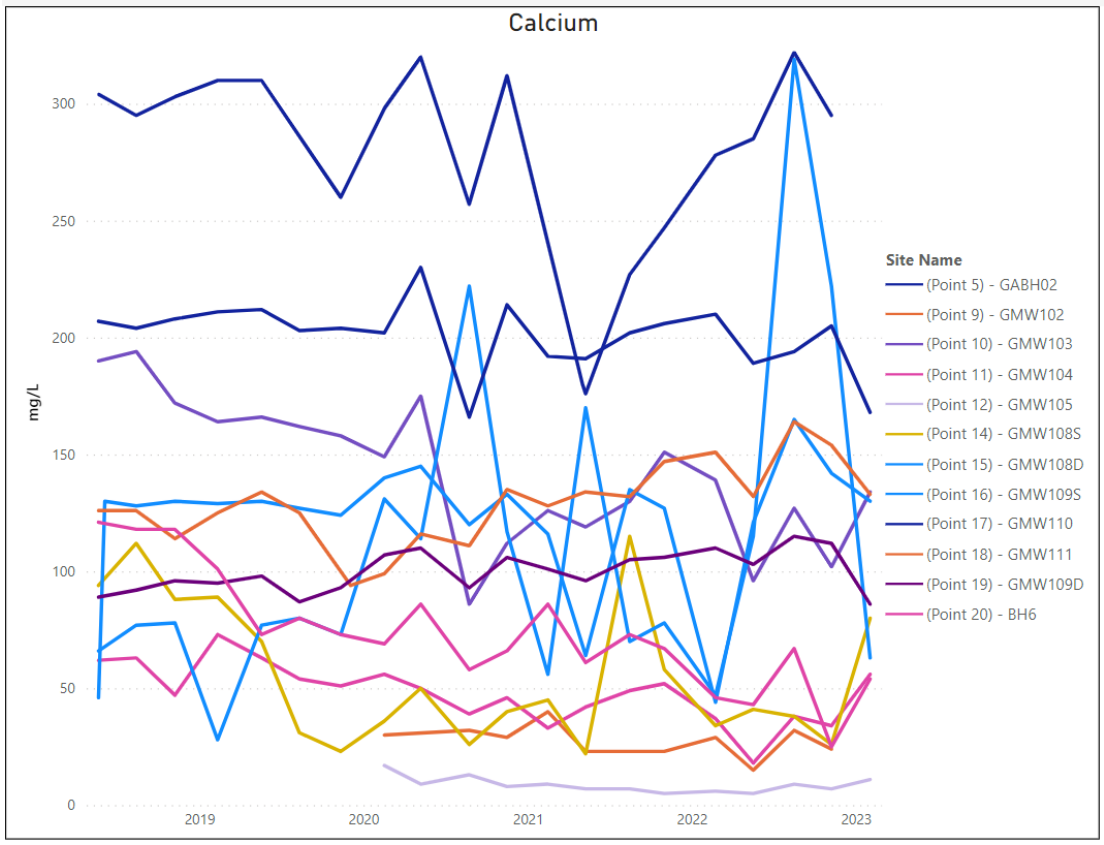

Xylene
1.0
0.8
0.6
0.4
0.2
0.0
µg/L
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

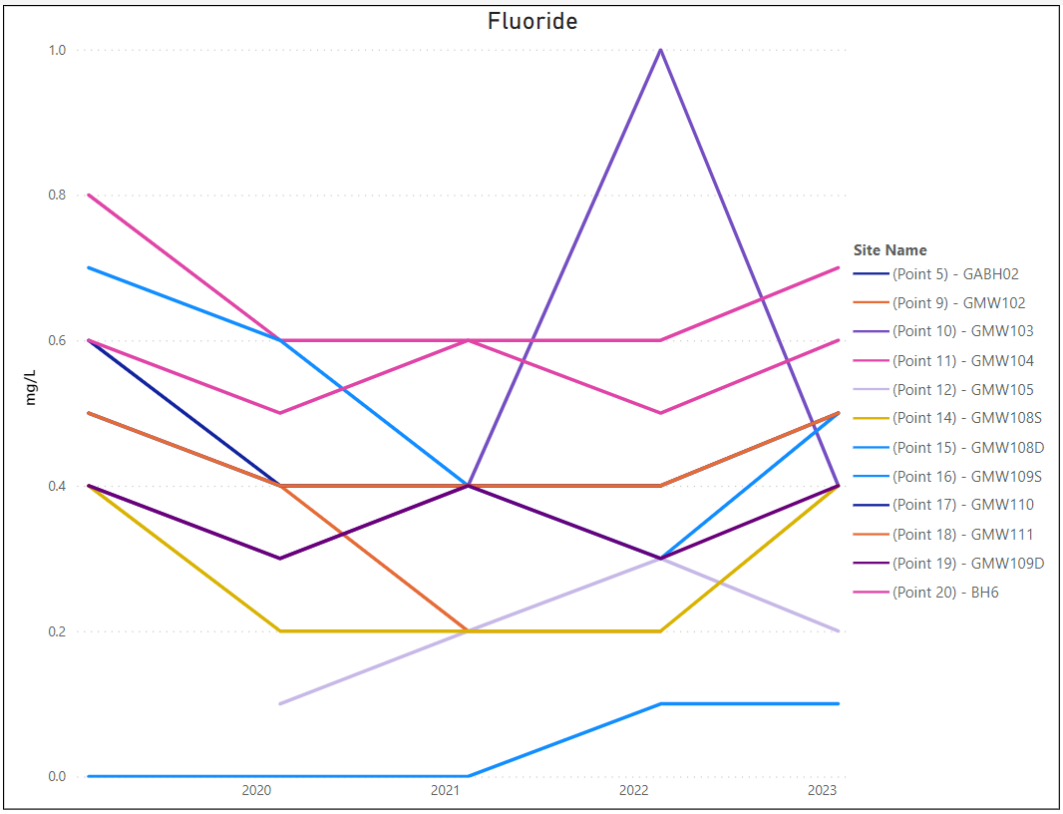

Total Dissolved Solids
3,000
2,500
2,000
1,500
1,000
500
0
mg/L
2019
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

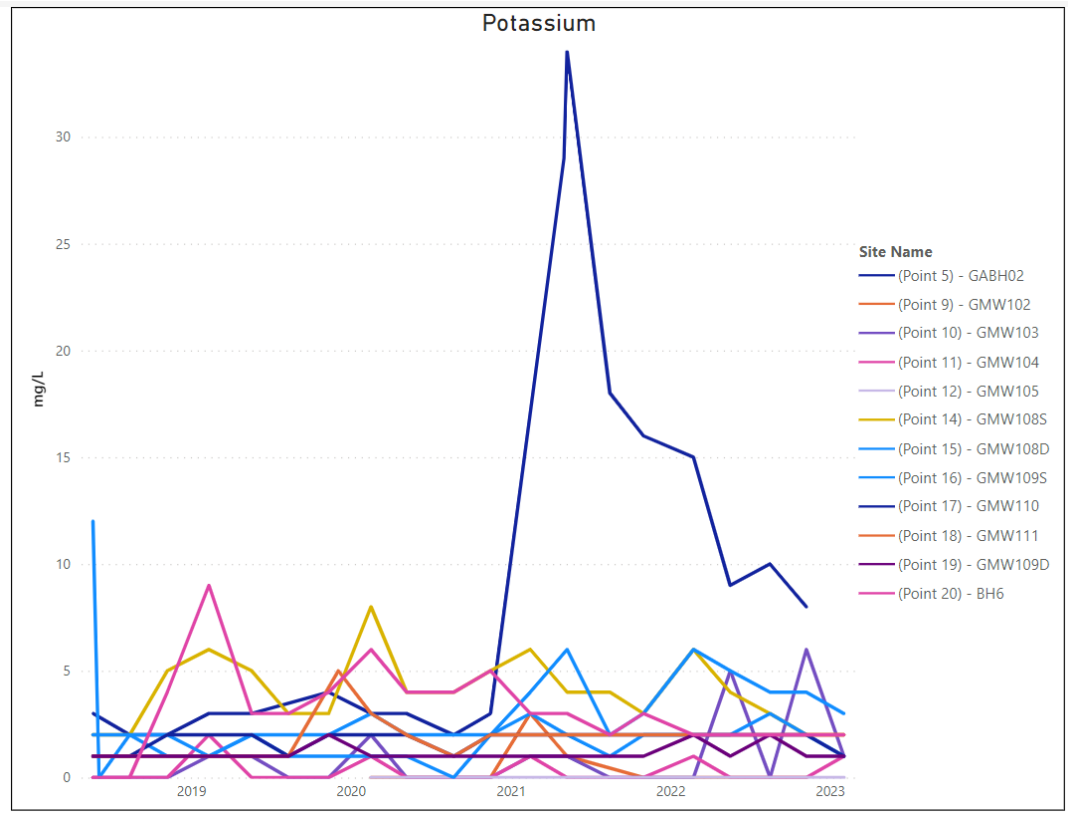

Depth
Meters
10
8
6
4
2
0
2019
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

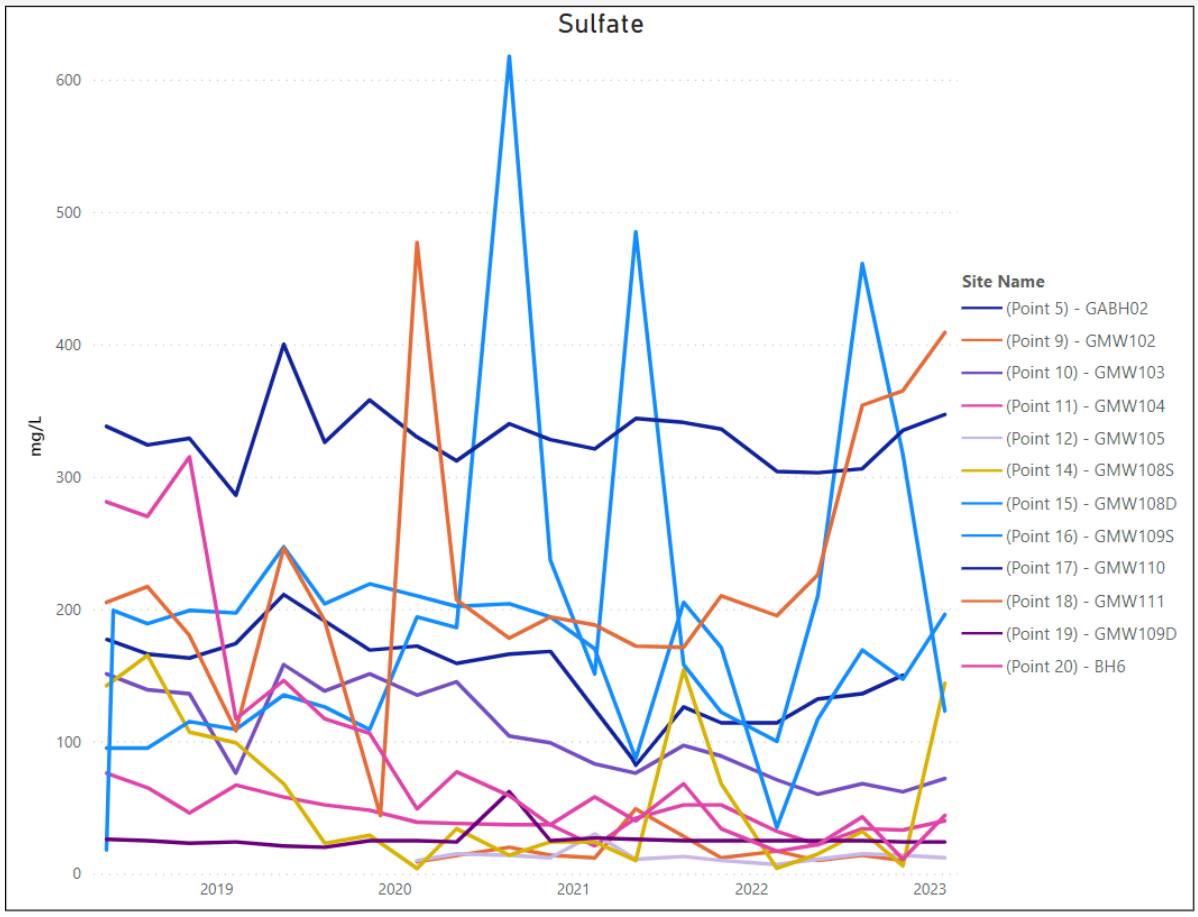

Alkalinity (as calcium carbonate)
mg/L
1,200
1,000
800
600
400
200
0
2019
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

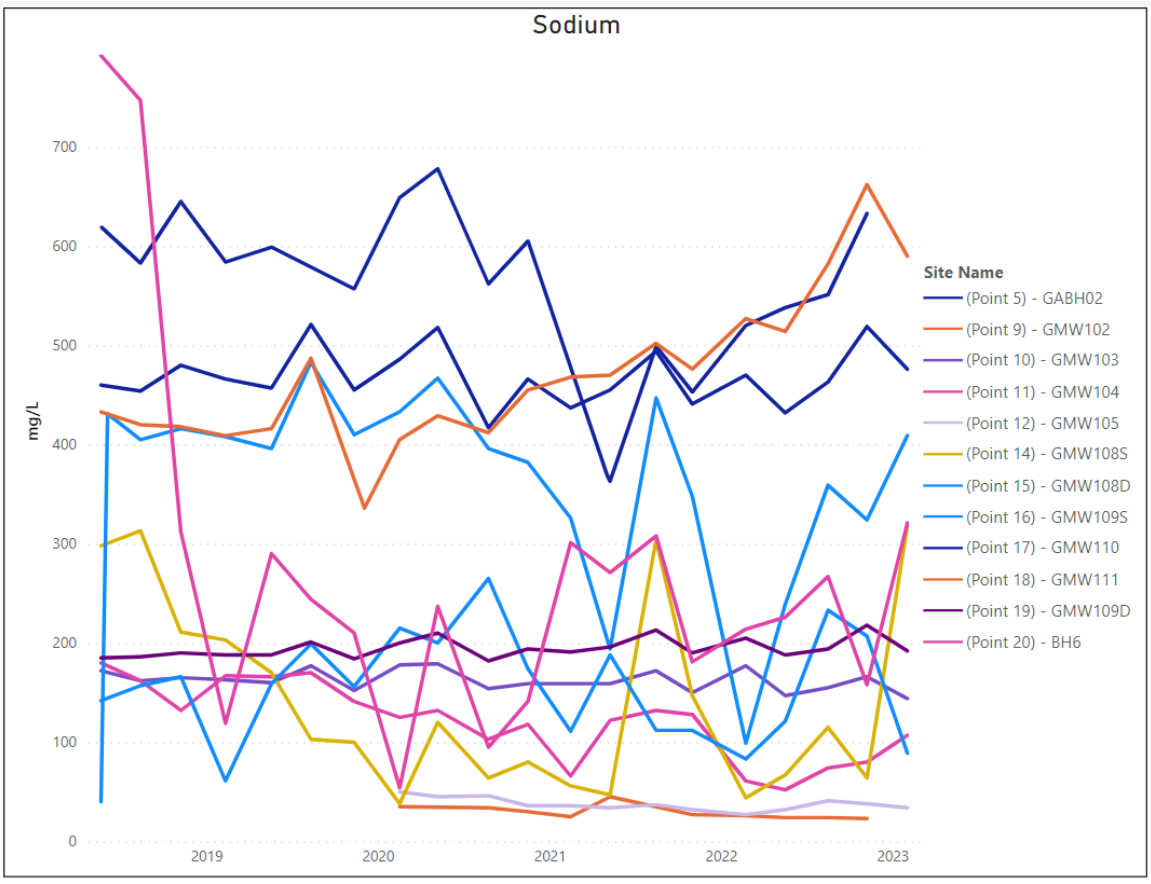

Chloride
mg/L
1,500
1,000
500
0
2019
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

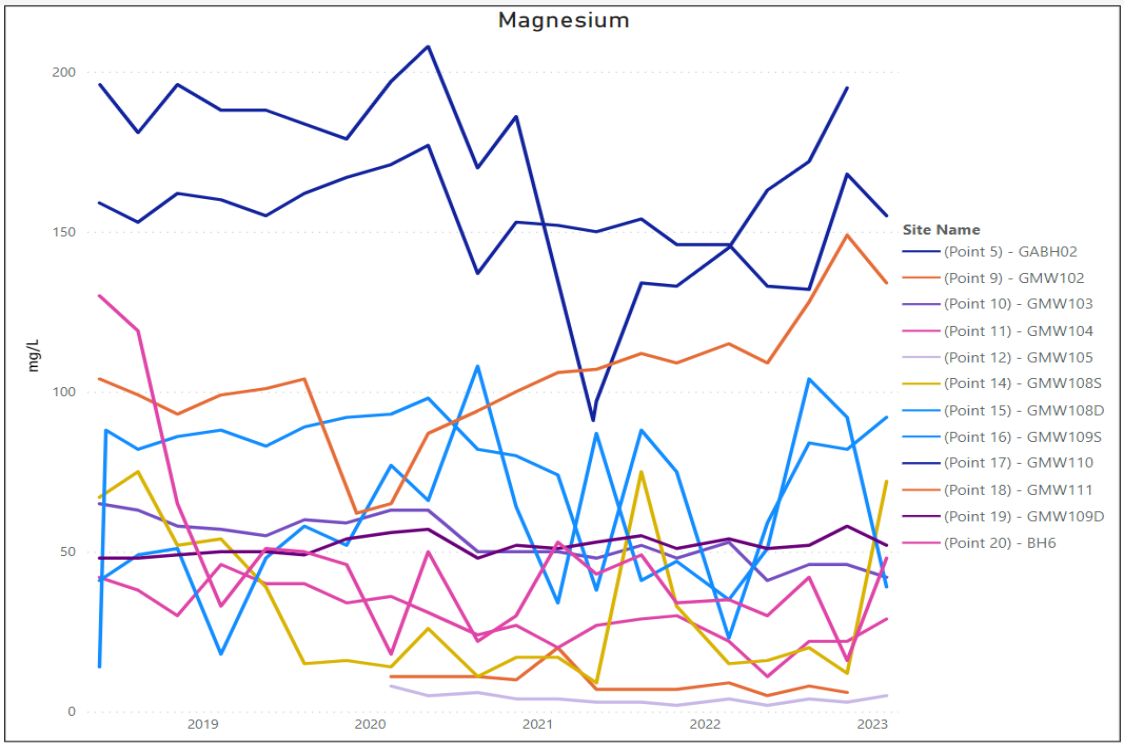

Calcium
mg/L
300
250
200
150
100
50
0
2019
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

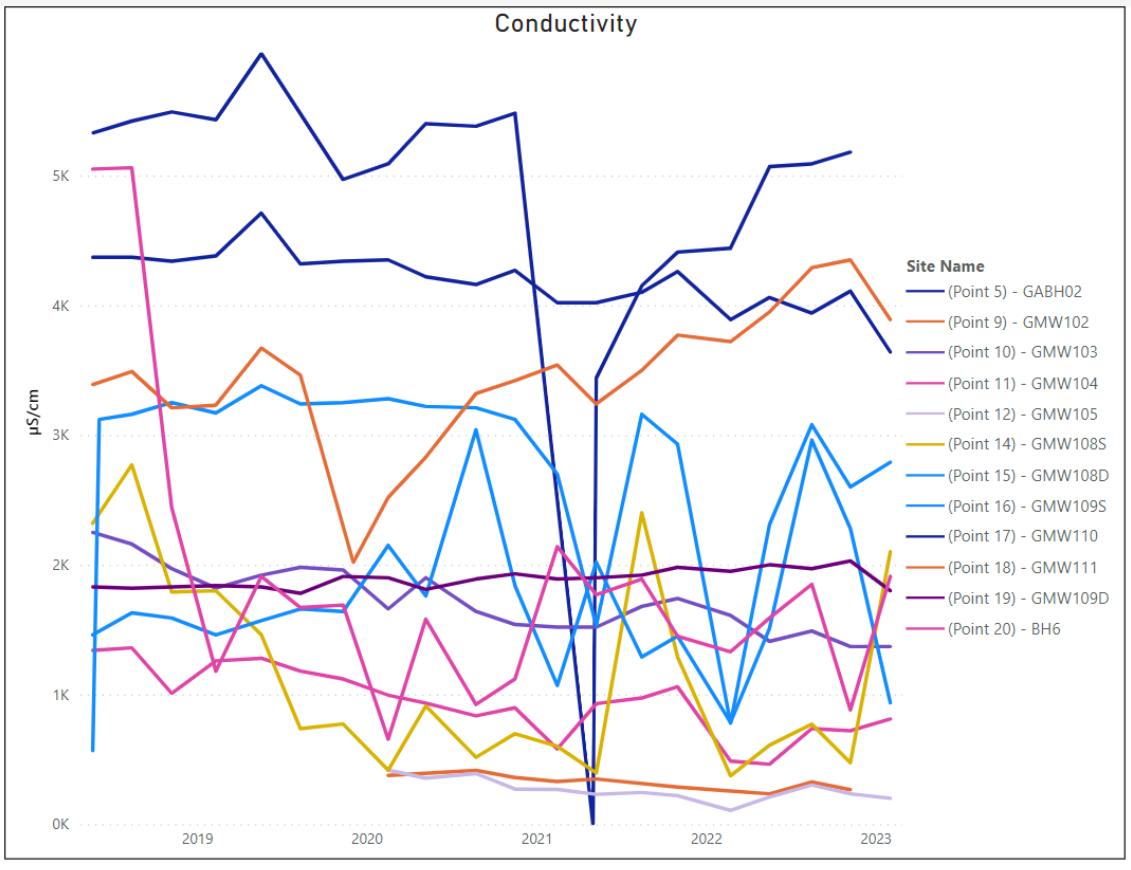

Fluoride
1.0
0.8
0.6
0.4
0.2
0.0
mg/L
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

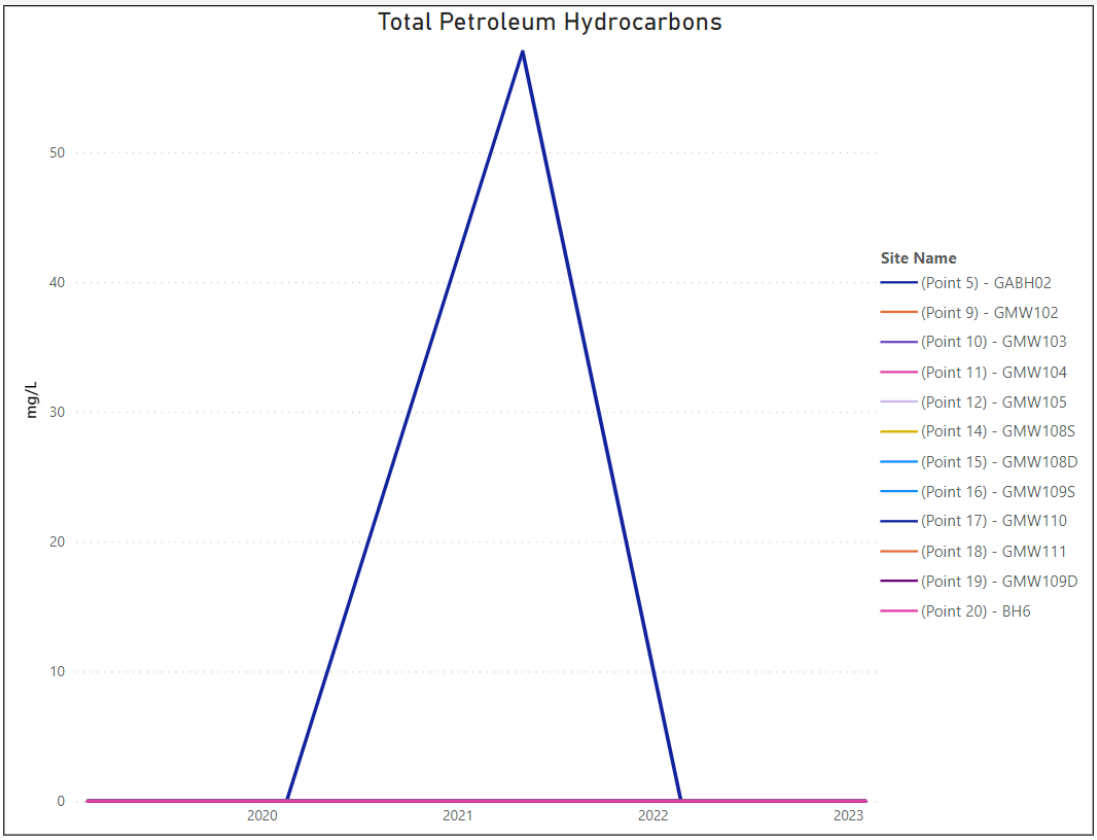

Potassium
30
25
20
15
10
5
0
mg/L
2019
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

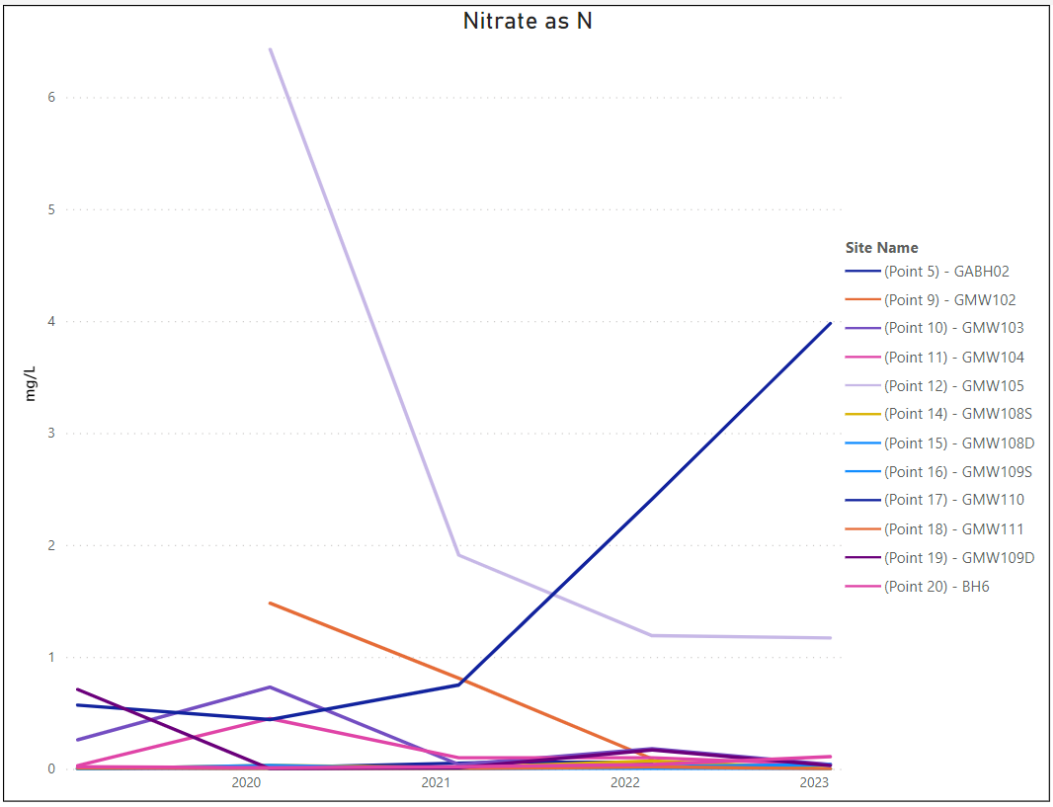

Sulfate
mg/L
600
500
400
300
200
100
0
2019
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

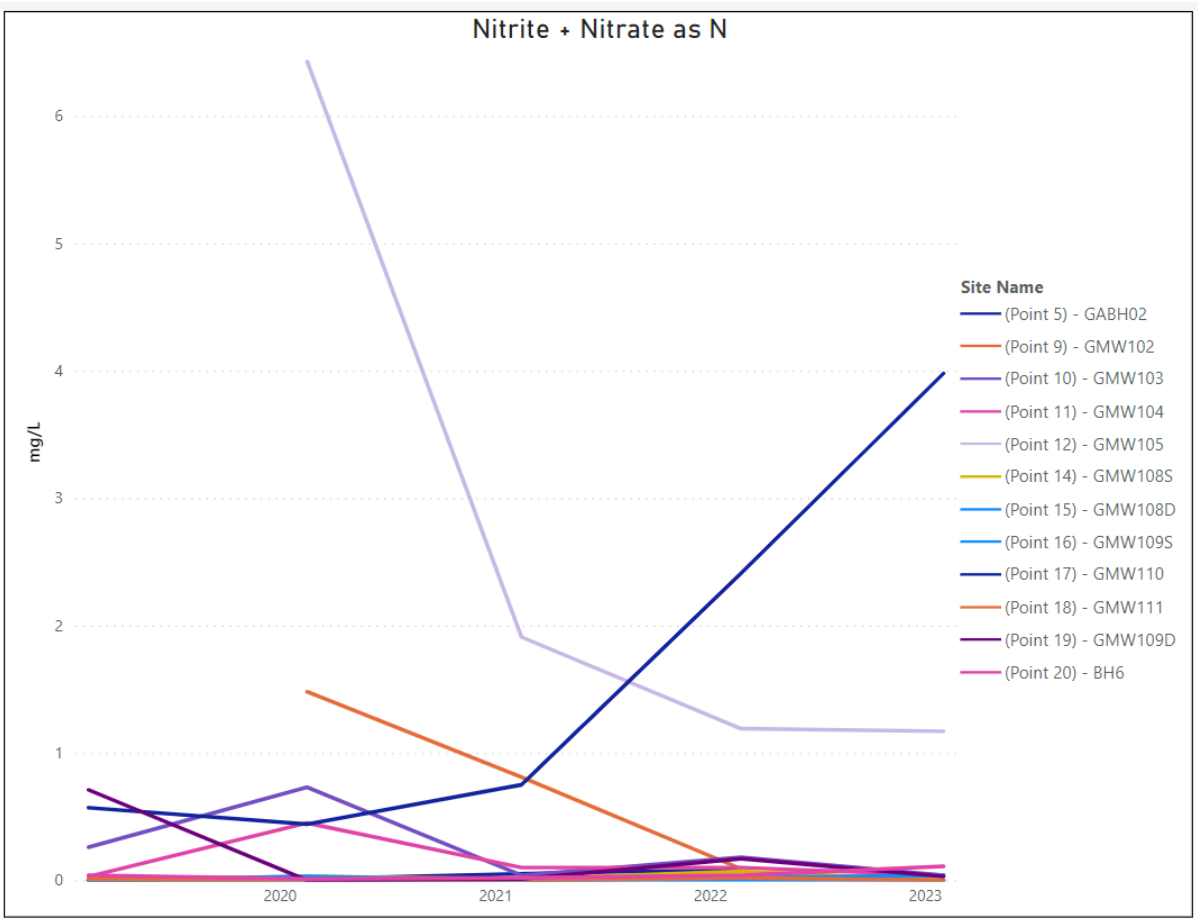

Sodium
mg/L
700
600
500
400
300
200
100
0
2019
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

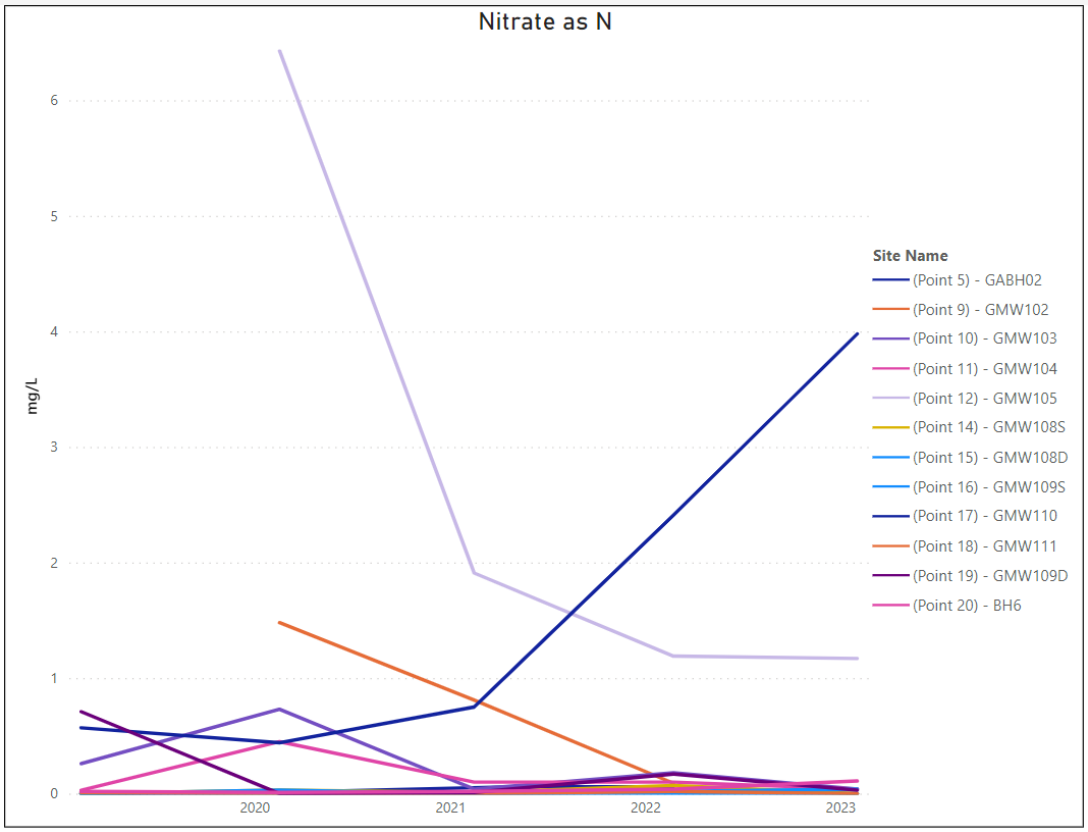

Magnesium
200
150
100
50
0
mg/L
2019
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

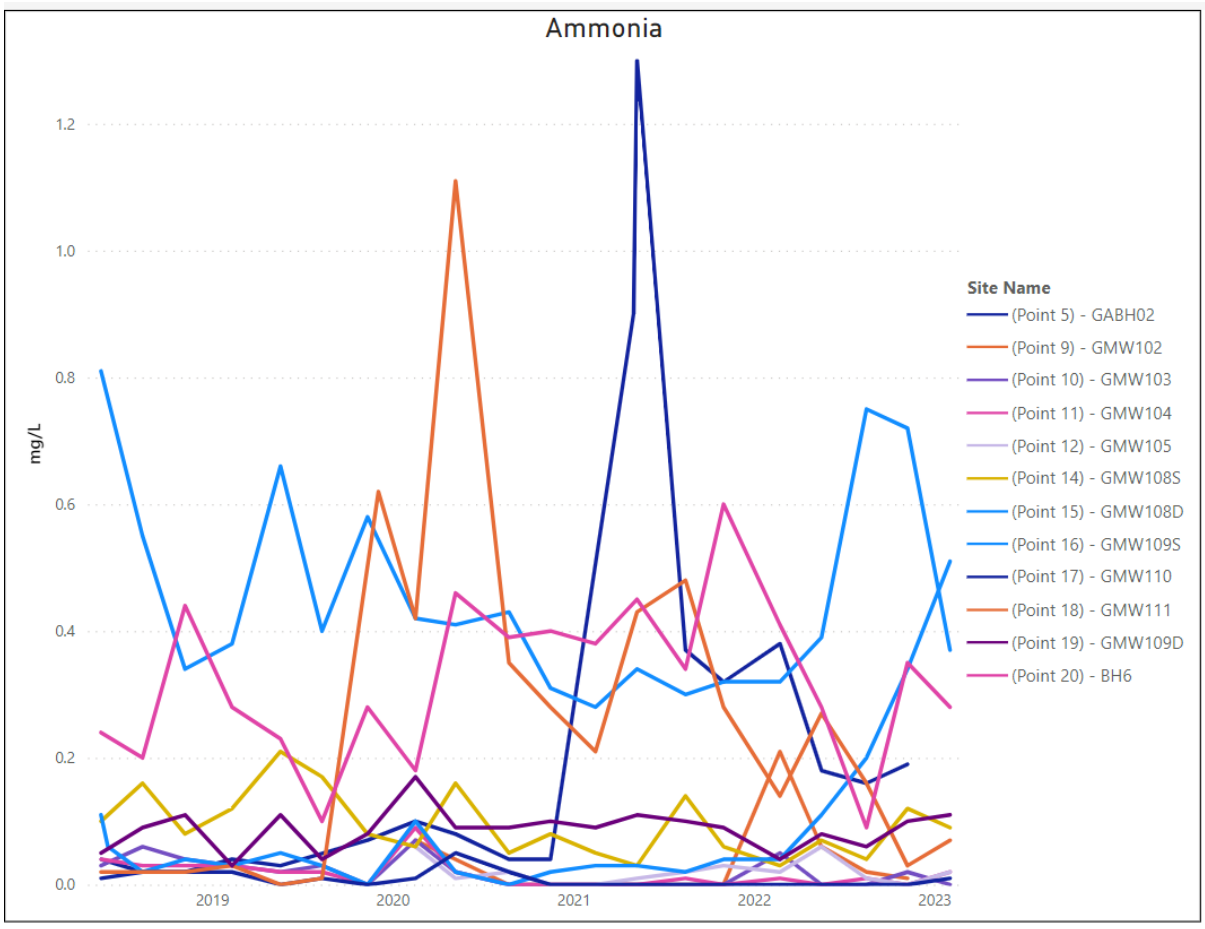

Conductivity
5K
4K
3K
2K
1K
0K
µS/cm
2019
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

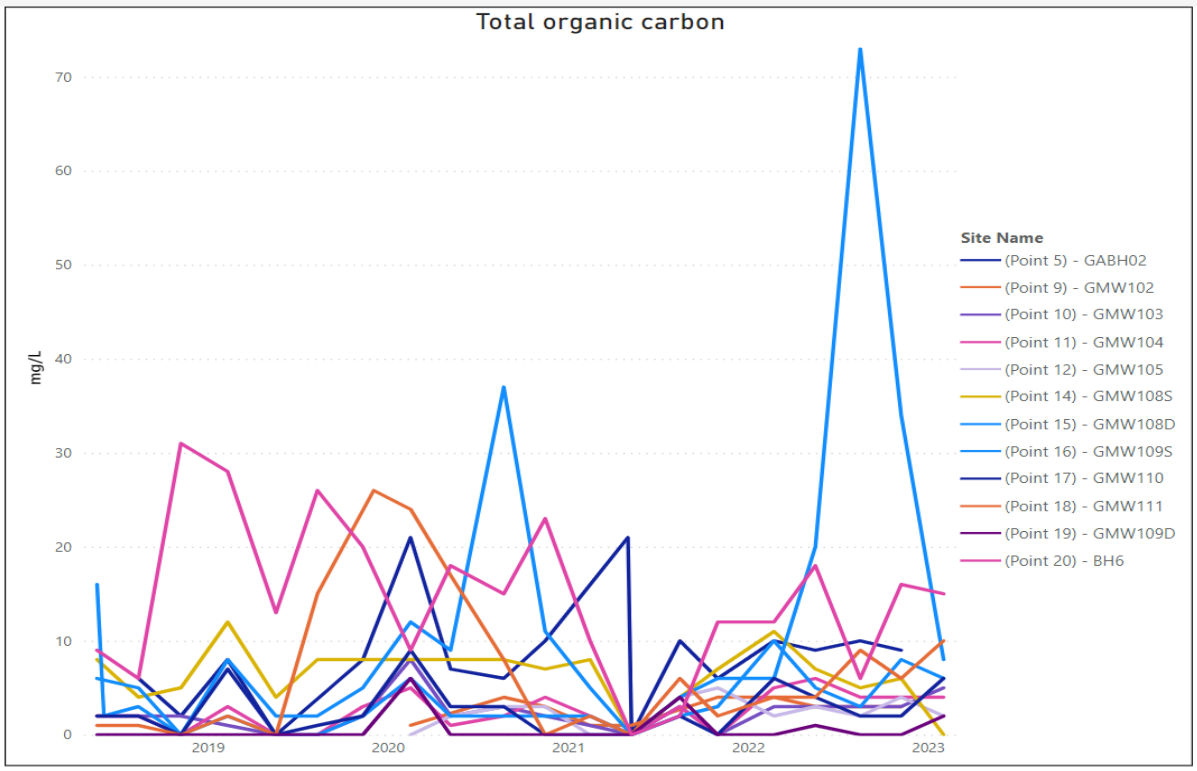

Total Petroleum Hydrocarbons
mg/L
50
40
30
20
10
0
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

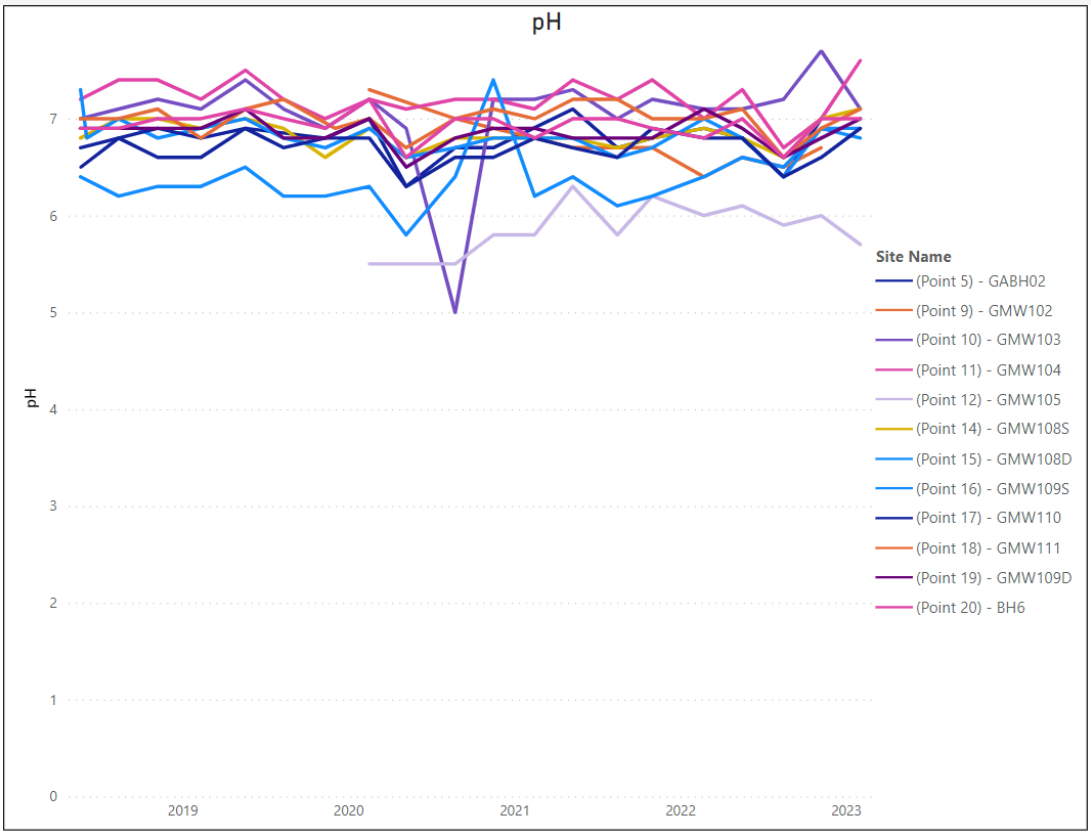

Nitrate as N
mg/L
6
5
4
3
2
1
0
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6


Nitrite + Nitrate as N
mg/L
6
5
4
3
2
1
0
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6


Nitrate as N
mg/L
6
5
4
3
2
1
0
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6


Ammonia
mg/L
1.2
1.0
0.8
0.6
0.4
0.2
0.0
2019
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6


Total organic carbon
mg/L
70
60
50
40
30
20
10
0
2019
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6


pH
pH
7
6
5
4
3
2
1
0
2019
2020
2021
2022
2023
Site Name
(Point 5) - GABH02
(Point 9) - GMW102
(Point 10) - GMW103
(Point 11) - GMW104
(Point 12) - GMW105
(Point 14) - GMW108S
(Point 15) - GMW108D
(Point 16) - GMW109S
(Point 17) - GMW110
(Point 18) - GMW111
(Point 19) - GMW109D
(Point 20) - BH6

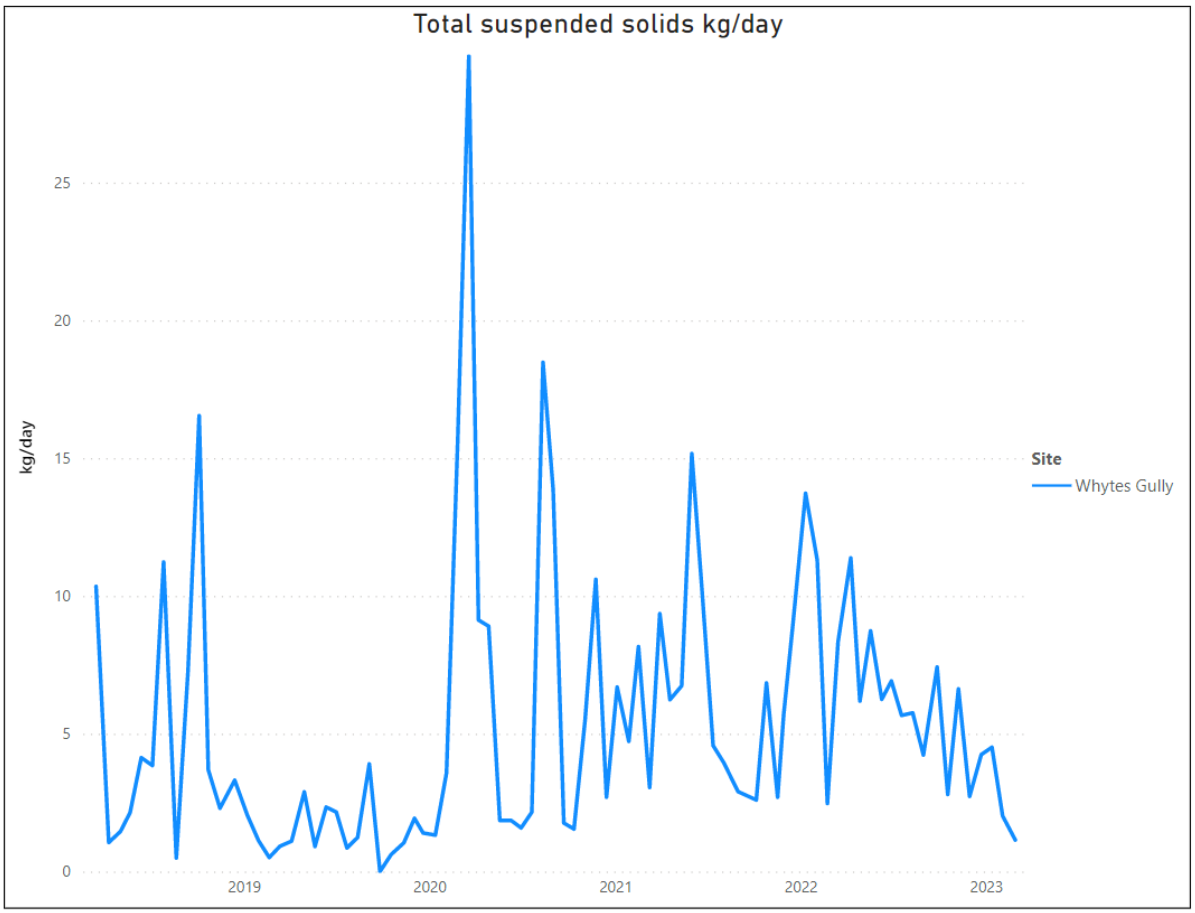
Appendix C: Trade Wastewater:

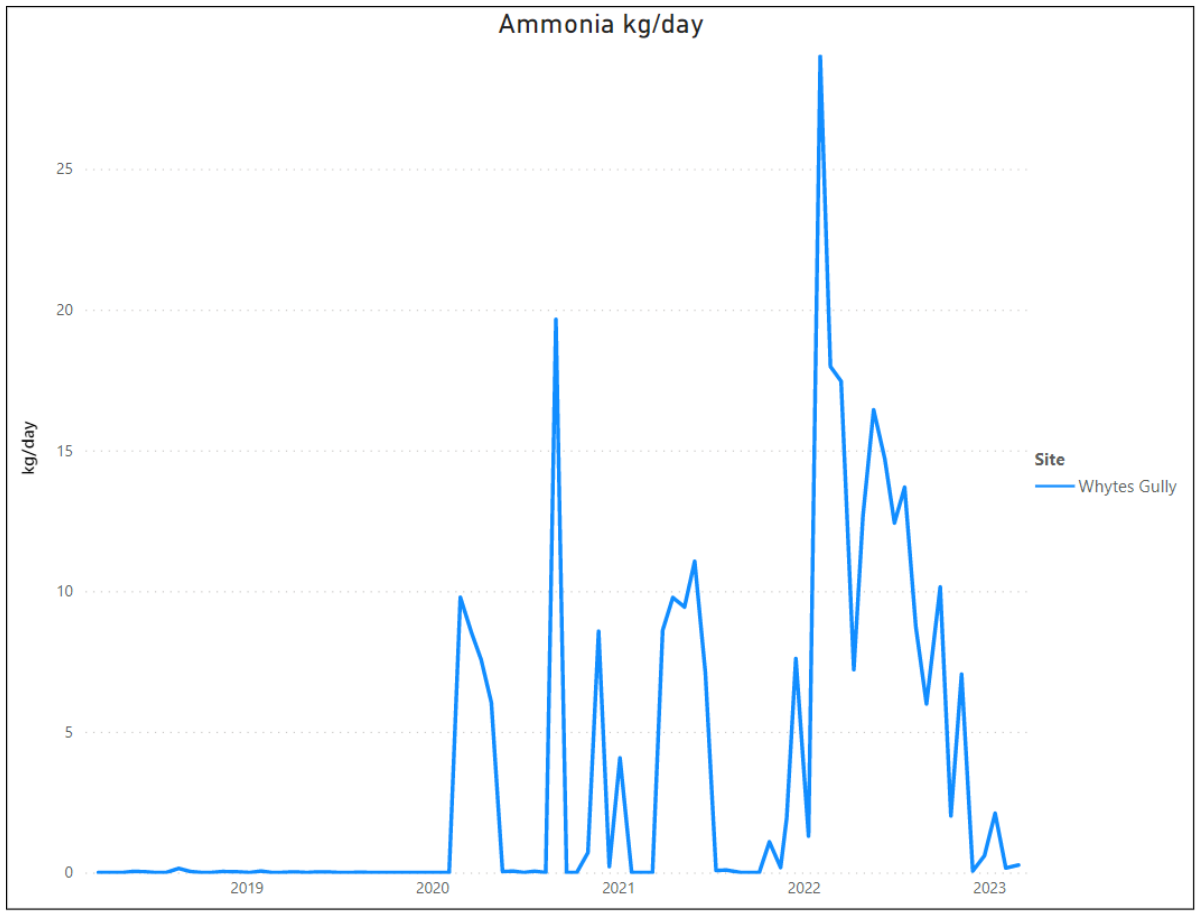
Tabulated Results and Trends

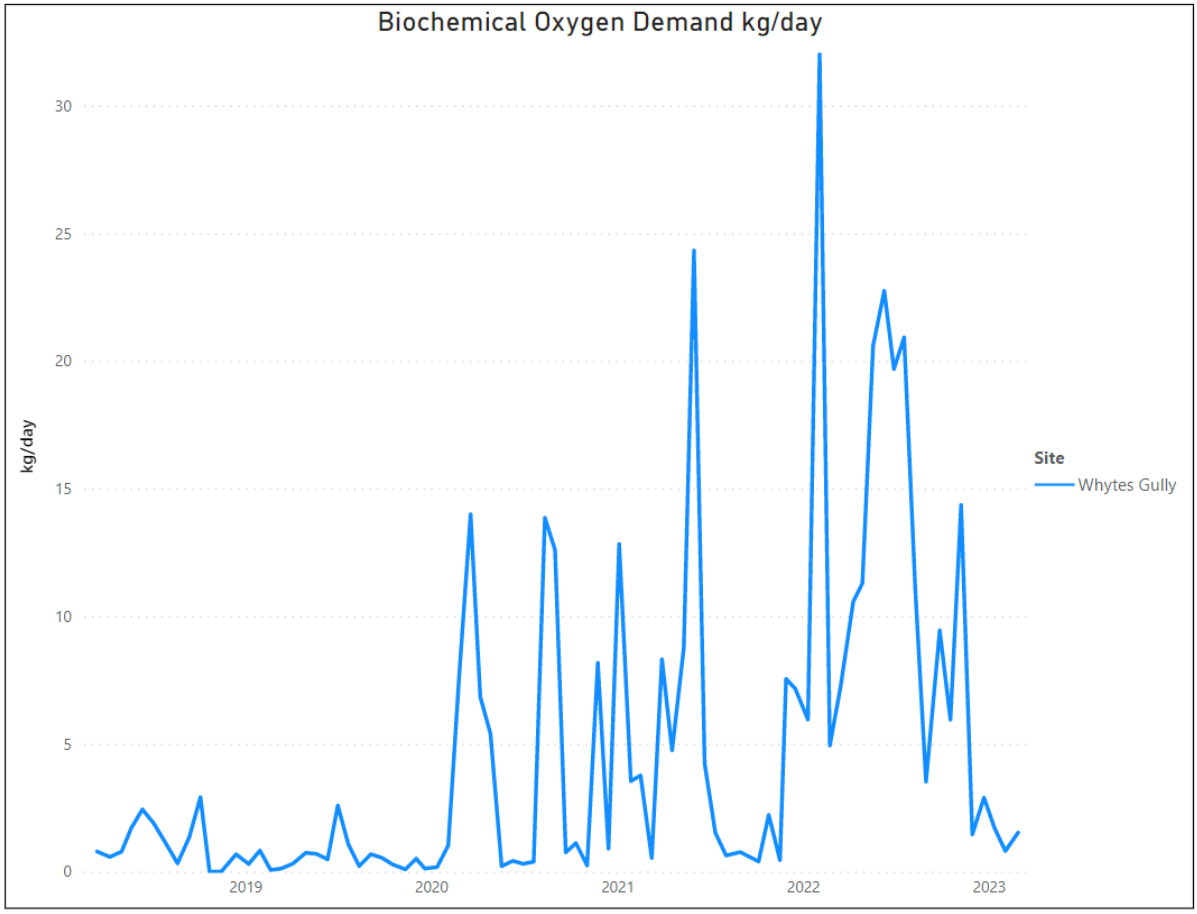
Date Sampled (Date)		15/03/2022	16/03/2022	09/04/2022	10/04/2022	27/04/2022	28/04/2022	18/05/2022	19/05/2022	09/06/2022	10/06/2022	28/06/2022	29/06/2022	18/07/2022	19/07/2022	09/08/2022	10/08/2022	30/08/2022	31/08/2022
Compound Name	Units																		
Ammonia	mg/L		62.8		26.6		47.1		52.7		58.8		46.7		62.8		36.4		25.5
Biochemical Oxygen Demand	mg/L		26.		39.		42.		66.		91.		74.		96.		46.		15.
Electrical Conductivity @ 25°C	µS/cm		2,680.		2,290.		3,290.		4,710.		4,550.		5,610.		4,690.		5,400.		6,290.
Finish Time	hrs		0.		0.		0.		0.		0.		0.		0.		0.		0.
Temperature	°C		22.		22.		21.		19.		12.		14.		12.		13.		18.
Total Dissolved Solids (Calc.)	mg/L		1,740.		1,490.		2,140.		3,060.		2,960.		3,650.		3,050.		3,510.		4,090.
Total suspended solids	mg/L		30.		42.		23.		28.		25.		26.		26.		24.		18.
Volume Discharged	kL		278.		271.		269.		312.		250.		266.		218.		240.		235.
Volume Discharged (corrected)	kL		278.		271.		269.		312.		250.		266.		218.		240.		235.
Meter Reading (start)	kL		124,806.93		131,870.16		137,211.11		142,925.94		148,725.36		153,571.77		158,412.84		163,456.22		168,416.35
Meter Reading (finish)	kL		125,085.3		132,141.33		137,480.24		143,237.91		148,974.9		153,837.3		158,631.22		163,696.47		168,651.48
pH (start)	pH	8.2		7.6		8.		8.2		7.9		8.		8.		7.		8.2	
pH (finish)	pH		8.1		8.		8.2		7.8		7.8		7.9		8.1		8.		7.8
Ammonia kg/day	kg/day		17.4584		7.2086		12.6699		16.4424		14.7		12.4222		13.6904		8.736		5.9925
Biochemical Oxygen Demand kg/day	kg/day		7.228		10.569		11.298		20.592		22.75		19.684		20.928		11.04		3.525
Total Dissolved Solids (Calc.) kg/day	kg/day		483.72		403.79		575.66		954.72		740.		970.9		664.9		842.4		961.15
Total suspended solids kg/day	kg/day		8.34		11.382		6.187		8.736		6.25		6.916		5.668		5.76		4.23

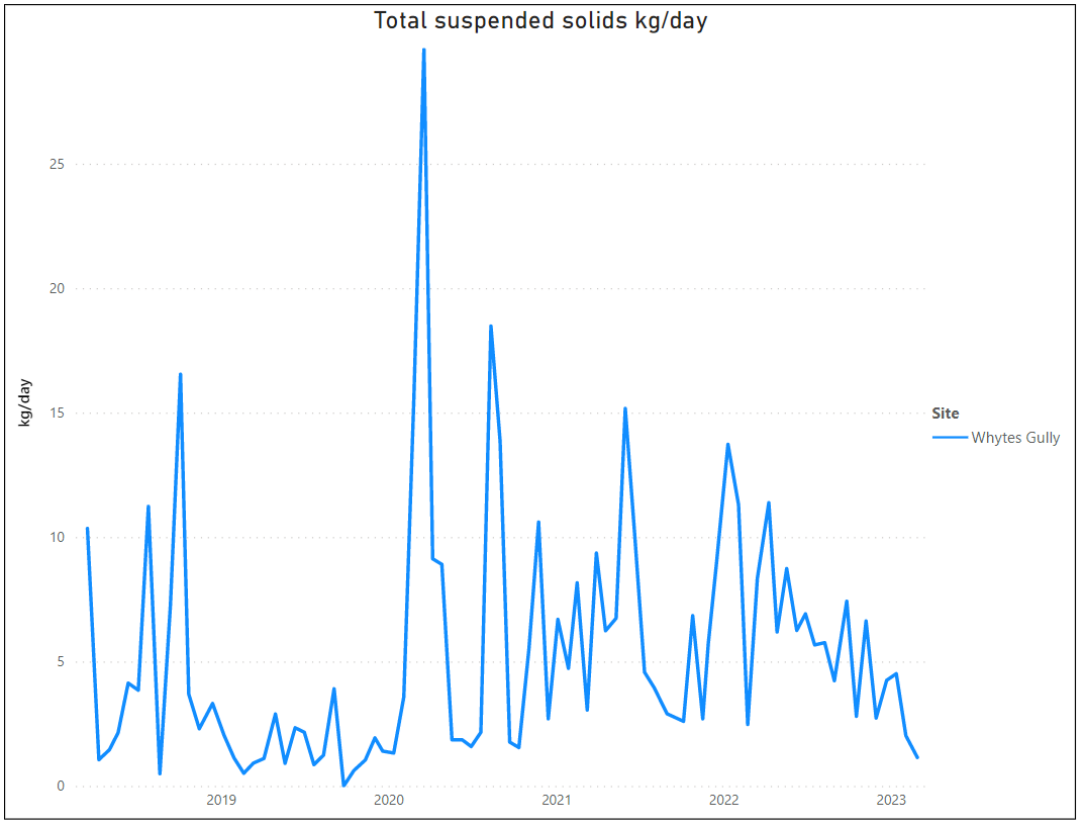
Date Sampled (Date)		27/09/2022	17/10/2022	18/10/2022	07/11/2022	08/11/2022	29/11/2022	30/11/2022	22/12/2022	23/12/2022	12/01/2023	13/01/2023	02/02/2023	03/02/2023	27/02/2023	28/02/2023
Compound Name	Units															
Ammonia	mg/L	45.1		11.5		31.9		0.3		3.1		11.2		0.8		1.4
Biochemical Oxygen Demand	mg/L	42.		34.		65.		8.		15.		9.		4.		8.
Electrical Conductivity @ 25°C	µS/cm	7,970.		4,990.		5,020.		5,470.		5,980.		6,590.		5,220.		6,600.
Finish Time	hrs	0.		0.		0.		0.		0.		0.		0.		0.
Temperature	°C	19.		19.		23.		22.		22.		24.		28.		24.
Total Dissolved Solids (Calc.)	mg/L	5,180.		3,240.		3,260.		3,560.		3,890.		4,280.		3,390.		4,290.
Total suspended solids	mg/L	33.		16.		30.		15.		22.		24.		10.		6.
Volume Discharged	kL	225.		175.		221.		182.		193.		188.		202.		191.
Volume Discharged (corrected)	kL	225.		175.		221.		182.		193.		188.		202.		191.
Meter Reading (start)	kL	174,316.3		179,050.23		183,589.3		187,324.14		191,939.		195,223.87		199,274.47		203,659.91
Meter Reading (finish)	kL	174,541.48		179,225.08		183,810.61		187,505.98		192,131.99		195,411.88		199,477.06		203,850.77
pH (start)	pH	7.7	7.9		7.8		7.5		7.8		7.5		7.7		7.8	
pH (finish)	pH	7.9		7.5		7.7		7.6		7.7		7.6		8.		7.5
Ammonia kg/day	kg/day	10.1475		2.0125		7.0499		0.0546		0.5983		2.1056		0.1616		0.2674
Biochemical Oxygen Demand kg/day	kg/day	9.45		5.95		14.365		1.456		2.895		1.692		0.808		1.528
Total Dissolved Solids (Calc.) kg/day	kg/day	1,165.5		567.		720.46		647.92		750.77		804.64		684.78		819.39
Total suspended solids kg/day	kg/day	7.425		2.8		6.63		2.73		4.246		4.512		2.02		1.146

Trade Wastewater Graphs




Ammonia kg/day
kg/day
25
20
15
10
5
0
2019
2020
2021
2022
2023
Site
Whytes Gully


Biochemical Oxygen Demand kg/day
kg/day
30
25
20
15
10
5
0
2019
2020
2021
2022
2023
Site
Whytes Gully


Total suspended solids kg/day
kg/day
25
20
15
10
5
0
2019
2020
2021
2022
2023
Site
Whytes Gully

Appendix D: Landfill Gas Tabulated results and trends
Table 1: Subsurface Gas Results

			Bal	Baro	CH4	CH4 Peak	CO	CO2	CO2 Peak	Flow	H2S	Relative Pressure	SWL	Well Depth
Units			%	hPa	%v/v	%v/v		%v/v	%v/v	l/h			Meters	Meters
Monitoring Point ID	Sample ID	Sample Date												
21	LFG MW1	17/03/2022	79.5	1011	0	0	0	0.1	0.1	0	0	0.03	1.75	10.2
		20/04/2022	79.2	1007	0	0	2	0.1	0.6	0	0	0.02	1.4	10.2
		18/05/2022	78.2	1025	0	0	0	0	0.3	0	0	0.02	1.54	10.2
		28/06/2022	78.5	1030	0	0	1	0.3	0.3	0	0	0.02	2	10.2
		15/07/2022	78.5	1024	0	0	0	1.3	1.3	0	0	0.02	1.72	10.2
		16/08/2022	78.9	1001	0	0	1	0.2	2.2	0	0	0	1.7	10.2
		15/09/2022	79.8	1010	0	0	2	0.1	0.9	0	0	0	1.69	10.2
		19/10/2022	80	1017	0	0	1	0.3	0.3	0	0	0	1.82	10.2
		24/11/2022	98.2	1011	0	0	1	0	0	0.5	0	0.03	1.92	10.2
		12/12/2022	99.3	993	0	0	1	0	0.1	0.1	0	0.02	2.25	10.2
		23/01/2023	98.8	1007	0	0	1	0	0.6	0.2	0	-0.05	2.56	10.2
		15/02/2023	98.3	1010	0	0	1	0	0	0	0	-0.02	2.67	10.2
22	LFG MW2	17/03/2022	85.4	1011	0	0	0	3.2	3.2	0	0	0.02	8.91	10.36
		20/04/2022	80.2	1007	0	0	1	0.4	0.7	0	0	0.02	8.75	10.36
		18/05/2022	78.5	1023	0	0	0	0.1	0.2	0	0	0.07	8.89	10.36
		28/06/2022	78.7	1029	0	0	0	0	0	0	0	0.05	9.85	10.36
		15/07/2022	80.2	1024	0	0	0	1.7	1.7	0	0	0.03	8.82	10.36
		16/08/2022	79.4	1001	0	0	1	0	1.8	0	0	0	9.36	10.36
		15/09/2022	81.2	1010	0	0	1	0.7	3	0	0	0.03	9.3	10.36
		19/10/2022	81.2	1011	0	0	0	0.3	0.5	0	0	0.03	8.78	10.36
		24/11/2022	98.1	1011	0	0	2	0	1	0.5	0	0	9.42	10.36
		12/12/2022	99.3	993	0	0	1	0	0.8	0.4	0	0.03	10.13	10.36
		23/01/2023	98.3	1007	0	0	1	0.6	0.6	0.1	0	0.07	10.3	10.36
		15/02/2023	98.5	1010	0	0	1	0	1	0.1	0	0	DRY	10.36
23	LFG MW3	17/03/2022	85.4	1011	0	0	0	2.7	2.7	0	0	0	3.3	10.52
		20/04/2022	84.6	1007	0	0	2	6.5	6.5	0	0	0	5.11	10.52
		18/05/2022	79.9	1016	0	0	0	2.2	2.2	0	0	0.07	3.44	10.52
		28/06/2022	78.5	1025	0	0	1	2	2	0	0	<0.02	5.74	10.52
		15/07/2022	81.1	1018	0	0	1	1.2	1.2	0	0	0.03	2.95	10.52
		16/08/2022	79.6	1001	0	0	1	1.8	1.8	0	0	0	5.66	10.52
		15/09/2022	79.3	1010	0	0	1	2.8	9.1	0	0	0.02	5.62	10.52
		19/10/2022	82	1011	0	0	1	2.6	2.6	0	0	0	5.42	10.52
		24/11/2022	97.2	1011	0	0	2	1	1	0.2	0	0	5.73	10.52
		12/12/2022	98.5	993	0	0	1	0.8	0.8	0.1	0	0.07	5.72	10.52
		23/01/2023	98.2	1007	0	0	2	0.6	0.6	0.2	0	0	5.88	10.52
		15/02/2023	97.7	1010	0	0	1	1	1	0.2	0	0.03	5.74	10.52
24	LFG MW4	17/03/2022	85.8	1011	0	0	0	9.2	9.2	0	0	0.07	DRY	9.27
		20/04/2022	79.4	1007	0	0	1	0	0	0	0	0	DRY	9.27
		18/05/2022	78.9	1016	0	0	0	0	1.6	0	0	0	DRY	9.27
		28/06/2022	81.8	1023	0	0	1	4	4	0	0	0.07	DRY	9.27
		15/07/2022	80.3	1018	0	0	0	0	0	0	0	0	DRY	9.27
		16/08/2022	80	1001	0	0	1	1.3	1.3	0	0	0	DRY	9.27
		15/09/2022	85.4	1010	0	0	1	9.4	9.4	0.1	0	0.03	DRY	9.27
		19/10/2022	83.4	1011	0	0	0	3	3	0	0	0.05	DRY	9.27
		24/11/2022	97.8	1011	0	0	2	0.2	0.3	0	0	0	8.03	9.27
		12/12/2022	99.3	993	0	0	1	0	1	0.1	0	0.02	8	9.27
		23/01/2023	98.2	1007	0	0	2	0.6	0.6	0.2	0	0	8.15	9.27
		15/02/2023	98.2	1010	0	0	1	0.6	0.8	0.1	0	0	8.21	9.27
25	LFG MW5	17/03/2022	81.1	1011	0	0	0	2.4	2.4	0	0	0.03	8.07	12.03
		20/04/2022	79.8	1008	0	0	1	0.2	0.2	0	0	0.02	7.82	12.03
		18/05/2022	79.9	1016	0	0	0	1	1	0	0	0	8.07	12.03
		28/06/2022	79	1023	0	0	0	0.4	0.4	0	0	0.09	9.22	12.03
		15/07/2022	85.7	1018	0	0	1	8	8	0	0	0	7.8	12.03
		16/08/2022	78.9	1001	0	0	0	0	0	0	0	0.03	8.72	12.03
		15/09/2022	80.7	1010	0	0	1	3.1	3.6	0	0	0.03	8.69	12.03
		19/10/2022	80.9	1011	0	0	0	0.1	0.1	0	0	0	8.56	12.03
		24/11/2022	98.2	1011	0	0	1	0	0	0.1	0	0	9.23	12.03
		12/12/2022	98.5	993	0	0	1	0.9	0.9	0.3	0	0.02	9.52	12.03
		23/01/2023	98.6	1007	0	0	1	0.2	0.7	0.2	0	0.03	10.42	12.03
		15/02/2023	98.7	1010	0	0	1	0.1	0.1	0	0	0.02	10.6	12.03

			Bal	Baro	CH4	CH4 Peak	CO	CO2	CO2 Peak	Flow	H2S	Relative Pressure	SWL	Well Depth
Units			%	hPa	%v/v	%v/v		%v/v	%v/v	l/h			Meters	Meters
Monitoring Point ID	Sample ID	Sample Date												
26	LFG MW6	17/03/2022	79.7	1011	0	0	0	0.3	0.3	0	0	-0.02	DRY	10.85
		20/04/2022	80.3	1008	0	0	1	0	0	0	0	0.03	DRY	10.85
		18/05/2022	79	1017	0	0	0	0.1	0.3	0	0	0.02	DRY	10.85
		28/06/2022	78.8	1023	0	0	1	0	0	0	0	-0.03	DRY	10.85
		15/07/2022	79.7	1018	0	0	0	0.6	0.6	0	0	0.02	DRY	10.85
		16/08/2022	78.9	1001	0	0	0	0	0	0	0	0	DRY	10.85
		15/09/2022	81.3	1010	0	0	1	3.9	3.9	0.1	0	0.02	DRY	10.85
		19/10/2022	81.4	1011	0	0	0	0.1	0.1	0	0	0.02	DRY	10.85
		24/11/2022	97.7	1011	0	0	1	0	0.2	0.1	0	0.03	DRY	10.85
		12/12/2022	99.4	992	0	0	1	0	0.4	0.2	0	0.02	DRY	10.85
		23/01/2023	98.2	1007	0	0	1	7	0.7	0	0	0.05	DRY	10.85
		15/02/2023	98.6	1010	0	0	1	0	0.3	0	0	0	DRY	10.85
27	LFG MW7	17/03/2022	79.9	1011	0	0	0	1.1	1.6	0	0	0.05	6.18	12.33
		20/04/2022	80.2	1008	0	0	1	0.5	1.1	0	0	0.02	5.72	12.33
		18/05/2022	78.8	1017	0	0	0	0.3	1.4	0	0	0	6.18	12.33
		28/06/2022	78.2	1023	0	0	1	0.7	0.7	0	0	0	6.73	12.33
		15/07/2022	78	1018	0	0	0	2.2	2.6	0	0	0.03	6.33	12.33
		16/08/2022	78.4	1001	0	0	1	0	0.1	0	0	0	6.48	12.33
		15/09/2022	79	1010	0	0	1	0.7	1.2	0	0	0	6.47	12.33
		19/10/2022	81	1011	0	0	0	1.1	1.3	0	0	0	6.7	12.33
		24/11/2022	97.5	1011	0	0	1	0.2	0.3	0.2	0	0.09	6.71	12.33
		12/12/2022	98.9	992	0	0	1	0.5	0.6	0.1	0	0.02	6.92	12.33
		23/01/2023	98.6	1007	0	0	1	0.3	0.4	0.1	0	0	7.41	12.33
		15/02/2023	98.2	1010	0	0	1	0.4	0.4	0	0	0	7.5	12.33
28	LFG MW8	17/03/2022	78.1	1011	0	0	0	2.3	2.3	0	0	0.03	5.37	10.37
		20/04/2022	79.6	1008	0	0	0	0.1	0.1	0	0	0.07	4.99	10.37
		18/05/2022	78.6	1017	0	0	0	0	0.2	0	0	0.12	5.38	10.37
		28/06/2022	78.8	1024	0	0	0	0.1	0.1	0	0	0	6.57	10.37
		15/07/2022	79.1	1018	0	0	0	0.2	0.2	0	0	-0.03	5.58	10.37
		16/08/2022	79.7	1001	0	0	1	0	0.3	0	0	0	6.09	10.37
		15/09/2022	79.2	1010	0	0	1	0.1	0.3	0	0	0.07	6.06	10.37
		19/10/2022	80.9	1011	0	0	0	0.1	0.1	0	0	0.02	5.95	10.37
		24/11/2022	97.4	1011	0	0	0	0	0.6	0.2	0	0.05	6.47	10.37
		12/12/2022	99.5	992	0	0	1	0	0.2	0.3	0	0	7.19	10.37
		23/01/2023	98.9	1007	0	0	1	0	0.4	0.2	0	0.03	7.66	10.37
		15/02/2023	98.6	1010	0	0	1	0	0.4	0.2	0	0.05	7.48	10.37
29	LFG MW9	17/03/2022	86.4	1011	0	0	0	3.2	3.2	0.1	0	0.02	2	10.7
		20/04/2022	80.2	1008	0	0	0	1.3	1.3	0	0	0.02	3.42	10.7
		18/05/2022	78.4	1017	0	0	0	1.6	1.6	0	0	0	3.32	10.7
		28/06/2022	78.5	1023	0	0	1	1.2	1.2	0	0	0.05	5.5	10.7
		15/07/2022	79.8	1018	0	0	0	0.5	0.5	0	0	0	3.26	10.7
		16/08/2022	79.7	1001	0	0	0	0.2	1.4	0	0	0	4.85	10.7
		15/09/2022	79.6	1010	0	0	1	0.2	1.5	0	0	0.05	4.8	10.7
		19/10/2022	82.7	1011	0	0	0	1.6	1.6	0	0	0.02	4.55	10.7
		24/11/2022	96.8	1011	0	0	1	0.4	2.7	0.2	0	0.02	5.2	10.7
		12/12/2022	99.5	992	0	0	1	0.1	3.1	0.4	0	0	5.81	10.7
		23/01/2023	98.6	1007	0	0	1	0.3	3.4	0.1	0	0.03	6.38	10.7
		15/02/2023	98.3	1010	0	0	1	0.3	2.9	0	0	0.03	6	10.7
30	LFG MW10	17/03/2022	80.3	1011	0	0	0	1.5	1.5	0.1	0	0.02	9.32	12.38
		20/04/2022	90.9	1008	0	0	0	2.3	2.3	0	0	0	9.04	12.38
		18/05/2022	80.8	1018	0	0	0	2.2	2.3	0	0	0.03	8.88	12.38
		28/06/2022	80.6	1024	0	0	0	1.7	1.7	0	0	0.03	9.51	12.38
		15/07/2022	79.4	1018	0	0	0	0.6	0.6	0	0	-0.05	9.82	12.38
		16/08/2022	84.3	1001	0	0	0	1.3	3.5	0	0	0.03	9.45	12.38
		15/09/2022	81.1	1010	0	0	1	1.5	1.6	0	0	0.02	9.42	12.38
		19/10/2022	81	1011	0	0	0	0.6	0.6	0	0	0	9.25	12.38
		24/11/2022	94.3	1011	0	0	0	2.9	2.9	0.2	0	0.09	9.59	12.38
		12/12/2022	96.4	992	0	0	1	3.3	3.3	0.1	0	0.09	9.66	12.38
		23/01/2023	95	1007	0	0	0	3.9	3.9	0.3	0	0	9.95	12.38
		15/02/2023	96	1010	0	0	1	2.8	2.8	0.1	0	0	9.85	12.38
31	LFG MW11	17/03/2022	83	1011	0	0	0	3.2	3.2	0	0	<0.03	3.95	9.36
		20/04/2022	83	1008	0	0	0	3.2	3.2	0	0	0.02	4.81	9.36
		18/05/2022	81.5	1018	0	0	0	2.3	2.3	0	0	0	3.77	9.36
		28/06/2022	79.1	1024	0	0	0	0.5	0.5	0	0	0	5.43	9.36
		15/07/2022	80.6	1018	0	0	0	0.7	0.7	0	0	0.03	3.43	9.36
		16/08/2022	81.4	1001	0	0	0	3.3	3.3	0	0	0.02	5.33	9.36
		15/09/2022	81.1	1010	0	0	0	1.7	1.7	0	0	0.02	5.3	9.36
		19/10/2022	85.9	1011	0	0	0	2.6	2.6	0	0	0.03	4.51	9.36
		24/11/2022	96.2	1011	0	0	0	0.6	2.8	0	0	0.03	5.41	9.36
		12/12/2022	96.6	992	0	0	0	3.1	3.2	0.3	0	0	5.48	9.36
		23/01/2023	98.5	1007	0	0	1	0.3	1.8	0.3	0	0.02	5.36	9.36
		15/02/2023	97.1	1010	0	0	1	1.5	4.1	0.1	0	0	5.13	9.36
32	LFG MW12	17/03/2022	91.9	1012	0	0	0	5.6	5.6	0	0	<0.02	4.49	10.46
		20/04/2022	91.5	1008	0	0	0	4.5	4.5	0.1	0	0	4.5	10.46
		18/05/2022	90	1018	0	0	0	4.5	4.5	0	0	0	3.9	10.46
		28/06/2022	81.4	1024	0	0	0	3.2	3.2	0	0	0.02	4.98	10.46
		15/07/2022	85.4	1018	0	0	0	1.5	1.5	0	0	0	3.75	10.46
		16/08/2022	87.1	1001	0	0	0	3.5	3.5	0	0	0	4.93	10.46
		15/09/2022	79.6	1010	0	0	1	0.2	1.5	0	0	0	4.9	10.46
		19/10/2022	86.3	1011	0	0	0	2.6	2.6	0.1	0	0.03	4.36	10.46
		24/11/2022	93.8	1011	0	0	1	3.1	4	0.1	0	0.02	5.02	10.46
		12/12/2022	98.6	992	0	0	1	1.1	1.1	0.1	0	0	5.02	10.46
		23/01/2023	96.9	1007	0	0	1	1.9	1.9	0.3	0	0	5.16	10.46
		15/02/2023	94.5	1010	0	0	1	4.2	4.2	0.1	0	-0.02	4.76	10.46

Table 2: Accumulation – Buildings

Location	DateFormatted / Sample Number	22/03/2022 ppm	20/04/2022 ppm	19/05/2022 ppm	15/06/2022 ppm	18/07/2022 ppm	16/08/2022 ppm	13/09/2022 ppm	18/10/2022 ppm	25/11/2022 ppm	13/12/2022 ppm	24/01/2023 ppm	15/02/2023 ppm
Crib Room	Operations HUB Crib Room	2.7	0	2.4	3.4	1.4	3.3	0	0	0	0	0.1	0.1
Glengarry Cottage	Glengarry Front Office	8.1	0	2.4	4.9	1.4	26.4	1	13.5	0	0	7.9	1
	Glengarry Hallway	5.4	0	2.3	5.5	1.2	22.8	1	10.7	1.5	0	8	0.9
	Glengarry Kitchen	6.2	0	2.3	6.8	1.3	27.7	0	13.5	0	0	8.2	0.8
	Glengarry Managers Office	6.4	0	3.3	5.4	1.4	24.1	4.5	16.7	7.1	0	7.5	
	Glengarry Meeting Room	8.7	0	2.5	6.1	1.3	28.3	2.9	12.2	9.4	0	8.1	0.7
	Glengarry Operations HUB	6.8	0	2.5	6.4	1.3	28.1	1	13.3	10.9	0	8	0.8
	Glengarry Store	6.3	0	2.4	6.4	1.4	27.4	0	10.1	0	0	8	1
	Max reading gardens	3.4	0	6.5	1.3	1.5	13.9	0	0	1	0	5.4	0.1
Ops Office	Ops HUB	6.1	0	2.5	4.4	2.8	11	1.5	1.6	1.3	0	0	0.2
Recycle Centre	Recycle Shop Eastern Area	2.6	0	2.3	2.4	0.8	2	0	0	0	0	0.1	0
	Recycle Shop Western Area	2.7	0	2.4	2.6	1	1.8	0	0	0	0	0	0
SWERF	SWERF	2.6	0	2.5	1.1	0.8	1.7	0	0	0	0	0	0.1
Weighbridge	Weighbridge	2.4	0	2.4	8.5	0.8	2	0	0	0	0	4.4	0

Table 3: Surface Gas Results

DateFormatted		22/03/2022	20/04/2022	19/05/2022	15/06/2022	18/07/2022	16/08/2022	13/09/2022	18/10/2022	25/11/2022	13/12/2022	24/01/2023	15/02/2023
Location	Sample Number												
Transect 2	1				2.8								
	2				1.2								
	3				1.1								
	4				3.8								
Transect 3	1				12.9								
	2				3.7								
	3				13.5								
	4				10.1								
Transect 4	1				9.2								
	2				6.7								
	3				5.3								
	4				13.6								
	5				13.8								
Transect 5	1				6.6								
	2				8.2								
	3				13.2								
	4				10.2								
Transect 6	1				9.2								
	2				9.9								
	3				9.2								
	4				4.9								
Transect 7	1				25.3								1.7
	2				92.3								2.2
	3				12.1								88.2
	4				7.5								
Transect 8	1				14		65	0	0	0	0	123	5.5
	2				2000		16	0	0	20.8	270	22.9	52.1
	3				7.6		67	0	0	0	0	1130	64.2
	4				133		311	0	0	11.6	0		1150
	5						18.5	0	0	0	11		6.7
	6						13.6	0			12		14.9
Transect 9	1					11.6		0	0	0	11.7	6.7	7
	2					12		0	13.4	0	13.6	5.2	2.3
	3					9.7		0	81.3	107	1200	12.6	8.2
	4					12		0	18.5	0	2100	18.2	22
	5							0		172	75	17.5	2155
	6									174	0		580
	7									7800			
Transect 10	1	2.4	0	7.9	2.5	4.5	11.3	10	0	0	0	8.5	0.4
	10	2.6	1.7	9.1	8.9	6.2	6	1.3	0	16.2	12.1	6.2	5.5
	11	2.5	0	14	11.1	10.1	11.1	0	15.1	0	9.3	0	0.7
	12		0	4.8		6.3	10.7	0	0	0		0.1	0.1
	13		13.1	2.8			21.2	0		0			0.1
	14		0	11.2				0					0
	15		0	4				10.1					0
	16							0					0
	2	2.4	14.5	7.3	5.8	3.2	3.3	0	0	0	0	7.3	0.3
	3	2.7	13.9	5.8	3.2	1.6	2.3	0	0	0	0	5.1	0.1
	4	2.3	13.1	2.8	2.6	1.5	2.1	0	0	0	0	6	0
	5	18	0	4.5	3.5	1.9	20.5	0	53.9	0	1.4	0.9	0.1
	6	2.5	0	3.9	19.5	4.9	2.4	0	0	0	0	7.2	0
	7	5.4	0	3.6	7.2	10.5	3.9	0	38.8	24.9	1.3	14.9	0.3
	8	5	0	2.7	8	8.1	32	2.4	0	0	0	6	0.4
	9	3.1	0	5.5	17.5	35.5	8.1	14.1	0	0	0	1.4	0.2
Transect 11	1	3.8	0	3.9	17.5	31.4	18.5	0	0	0	11.5	0	0.2
	2	18	13.8	12.2	16	11.5	5.8	10.3	0	0	16.5	1.5	0.6
	3	12.1	10	12.5	32.1	15.4	11.6	0	0	2.7	23.2	1.8	17.3
	4	36.5	64.9	4.3	17.1	7.8	15.1	17.7	18.2	17.3	0	8.9	10.4
	5	6.1		28.2	5.3	8.8	7.9	0	118	22.1	0	5.3	8.1
	6	13.6			6.5	11.5	13.1	24.5	0	0	10.2	11.3	0.7
	7				16.4		9.1	11.1	0	0		5.4	118
	8												0.5
Transect 12	1	29.9	75.1	33.1	11.5	21.1	28.6	20	42.1	11.2	16.4	22.3	93.7
	2	30	30.6	40.1	20.1	7.6	40.4	23	32.7	10.2	11.2	21.6	11.9
	3	128	60	35	51	8	69.5	76	53.8	0	0	17.5	5.8
	4	20	20.8	20.6	42	355	22.4	0	10.6	0	10	18.1	1.8
	5	11.8	26.4	8.3	900	85.6	181	10.3	0	0	0	8.3	30.1
	6	7.2	13.6		17		23.8	1.2	0	1.2	10.4	8.5	6
	7		13.3		14		12.6	1.1	10.1			8.2	
	8							0					
Transect A	1	2.3	0	2.1	9	1	1.8	0	0	0	0	7.3	10.3
	2	2.3	0	1.9	5.9	0.9	1.8	0	0	0	0	0.1	6.6
	3	2.3	0	2	2.6	1	2	0	0	0	0	0	2.2
	4	2.2	0	2	1.6	1	1.9	0	0	0	0	0	0.4
	5		0	2	1.3	1.1		0					0
	6			2		1.2		0					
Transect B	1										0		
	2										0		
	3										0		
	4										0		
	5										0		
	6										0		
	7										1.5		
	8										0		
Transect C	1	2.4	0	2.4	2.1	0.8	2	0	0	0		0.1	0.1
	2	2.4	0	2.2	1.2	0.8	1.9	0	0	0		0.1	0
	3	2.4	0	2.2	1.4	0.7	1.8	0	7.7	0		0.1	0
	4	2.7	0	2.8	1.6	0.7	1.9	0	0	0		0	0
	5	2.4	0	3.6	1.5	3.3	2	26.5	15.8	0		0.1	0.4
	6	2.3	0	3.9	1.7	4.1	2.5	18.1	35.1	12.3		0	0.3
	7	2.7	0	3.9	5.8	9.2	2.9	11.5	44	11.1		0.7	0.2
	8	2.3	0	3.3	2.3	3.8	2.1	48.5	42.4	0		0	0
	9						1.9			43.2			
Transect D	1	2.3			1.7	1.3	2.1	0	0	0	0	0	0
	2	2.3			1.9	1.5	2	4.8	0	10	0	0	0
	3	2.4			2	1.4	2.1	0	0	0	0	0	0.1
	4	7			1.7	1.3	2.2	0	0	13.2	0	0	0.1
	5				1.7	1.3	2.1	0	0	0	0		
	6									0			

DateFormatted		22/03/2022	20/04/2022	19/05/2022	15/06/2022	18/07/2022	16/08/2022	13/09/2022	18/10/2022	25/11/2022	13/12/2022	24/01/2023	15/02/2023
Location	Sample Number												
Transect E	1	2.6			1.4	0.9	1.2	0	0	1.7	0	0.1	0.1
	2	2.4			1.7	1.7	1.2	0	1.5	1.8	0	0	0.1
	3	2.3			1.4	1.4	1.8	0	0	13.2	0	0	0
	4				7.3	1.3	1.8	1.1	0	15.6	0	0	0
	5				2.5	1.4	1.2	2.8	0	17.4	0	0.1	0
	6				2.6			0		12.7	0	0	0
	7							0		1.3			
Transect F	1	2.2			1.3	0.8	1.6	1.3	0	2	0	0	0
	2	2.2			1	0.8	1.7	2.1	0	0	0	0.1	0
	3	2.5			1.1	0.9	2.1	0	1.5	1.3	0	0	0
	4	2.2			1.2	0.7	1.8	0	0	0	0	0	0
	5	2.4			1.8	0.6	1.5	0	0	0	0	0.1	0
	6				1.4	0.7	2.1	0	0	0	0	0	0
	7				1.8	1.8	1.6	0	1.9	0	0	0	0
	8				1.4	0.7	1.5	0	0	0	0	0	0
	9					0.7		0					
Transect G	1	2			1.8	1.1	1.4	0	0	0	0	0	0.1
	2	2			1.4	0.9	1.2	0	0	0	0	0	0.1
	3				1.8	1	1.8	0	16.1	2.6	0	0	0
	4				2		2	0	13.4	0	0	0	0
	5				1.6		1.7	0	0	0	0	0	0
	6				1.4		1.7	0	11.5	11.5	0	0	0
	7				1		1.6	15.3	13.8	11.2	0	0	0
Transect H	1	2.3	0	17	1.1	1.5	1.6	0	0	0	0	0	0
	2	2.3	0	2.5	1.5	1.2	1.8	0	0	0	0	0	0
	3	2.3	0	2.3	1.5	1.2	1.7	0	0	0	0	0.1	0.1
	4	2.3	0	2.1	1.5	1.4	1.5	0	14.1	0	0	0	0
	5	2.3	0	2	1.3	1.2	1.5	0	12.5	0	0	0	0
	6	2.3	0	2.7	1.3	1.5	1.5	0	12.3	0	0	0.1	0.1
	7					1.5	0.9	0	0	0		0	
	8						1.2		0	0			
Transect I	1	2.6	0	7.8	2	1.3	1.9	0	0	7.6	0	0.8	0.3
	2	2.3	0	8	1	1.5	1.6	0	0	0	0	0	0
	3	2.3	0	7.2	0.9	1.5	1.5	9.2	0	0	0	0	0.1
	4	2.3	0	7	0.9	1.9	1.6	0	0	1	0	0	0
	5	5.8	0	11.2	1	1.5	1.6	0	0	0	0	0	0
	6	2.4	0	18.2	1	2.3	4.4	14.1	0	0	0	0	0
	7			24.2			2						
Transect J	1	2.5	0	4.9	1.2	1.8	2	15.3	0	0	0	0	0
	2	4	0	3.4	0.9	1.3	1.8	0	0	0	0	0.1	0
	3	2.8	0	3.3	0.9	1.5	1.9	0	0	0	0	0	0.2
	4	2.5	0	3.2	0.8	0.8	1.7	0	0	0	0	0.1	0
	5	2.7	0	3.2	1.1		1.8	0	0	0	0	1	0.1
	6	2.6	0	3.8	1		1.6	0	0	0	0	0.1	0.1
	7		0	7.1						0		0	
Transect K	1	2.5	0	3.3	5.1	0.8	3.6	0	0	0	0	10.9	0.3
	2	2.5	0	7	1.2	1	2.4	0	0	7.3	50.3	5.2	0
	3	2.4	0	8.8	4	1.2	2.2	0	0	0	0	1.4	0.2
	4	8.6	0	13.8	35	1.4	2.2	0	980	0	0	0.4	0
	5	2.4	0	4.3	1.4	1.2	1.9	0	0	0	0	6	0.5
	6	2.7	0	3.6	1	1.2	2	0	0	0	0	0	
	7					1.2			0	0			
Transect L	1	2.9	0	15.4	1.5	1.2	4.1	0	0	0	0	0.7	11.3
	2	3	0	4.9	2.2	0.8	210	8.2	0	0	300	5.7	0.3
	3	2.6	0	37.1	5.7	0.8	19.9	0	24.8	13.4	0	8.4	0
	4	16.5	0	3.7	3.3	0.8	55.1	0	0	0	23	68.9	8.2
	5		0	5.5		0.8	2.4	0	0	1.3	0	1.3	0
	6		0	3.7		0.7		11.2	1	7.4	0	9.5	9.9
Transect M	1	3	0	4.1	3.9	0.8	2.1	0	0	17	0	1.2	0
	2	25	0	5	23	0.9	2.2	0	0	0	2	1.9	0
	3	2.4	0	5.1	1.2	1	11.6	1.2	0	0	23	0	0
	4	25.2	0	4.1	0.7	0.8	1.8	0	0	450	4000	0	9.7
	5	2.5	0	3.1	0.8	1.1	3.1	0		0	0	0.1	0.4
	6	2.9	0				4.5	0			0	0	0.3
Transect N	1	2.4	0	5	0.6	0.8	1.6	118	0	0	0	0	0
	2	2.4	0	3.1	0.5	0.5	1.5	0	0	0	0	0	0.2
	3	2.4	0	3.5	2.4	0.6	1.9	0	0	0	0	0	0
	4	2.4	0	3.1	1	0.7	2	0	0	0	0	0	8.5
	5	2.4	0	5.7	12.3	0.5	2	0	0	0	0	0	0
	6	8.1	0				2	1.2	0	0		0	0.1
181 Reddalls Rd, fenceline adjoining landfill	1			3.7	3.2			0		0	0		
	3			6.6	1			0		0	0		
	5			3	1.1			0		0	0		
	7			3.2	0.9			0		0	0		
	8			3.3	1			0		0	0		
181 Reddalls Rd, Immediate gardens max value	1			3.3	0.9			0					
	2			4.6	1.2			0		0	0		
	4			4.3	1.1			0		0	0		
	6			4.1	1			0		0	0		
Methane Blank (Post testing)	1	2.8	0	2.5	1	1.2	1.2	0	0	0	0	0.1	0
Methane Blank (Pre testing)	1	2.7	0	2.2	1.1	1	1	0	0	0	0	0	0

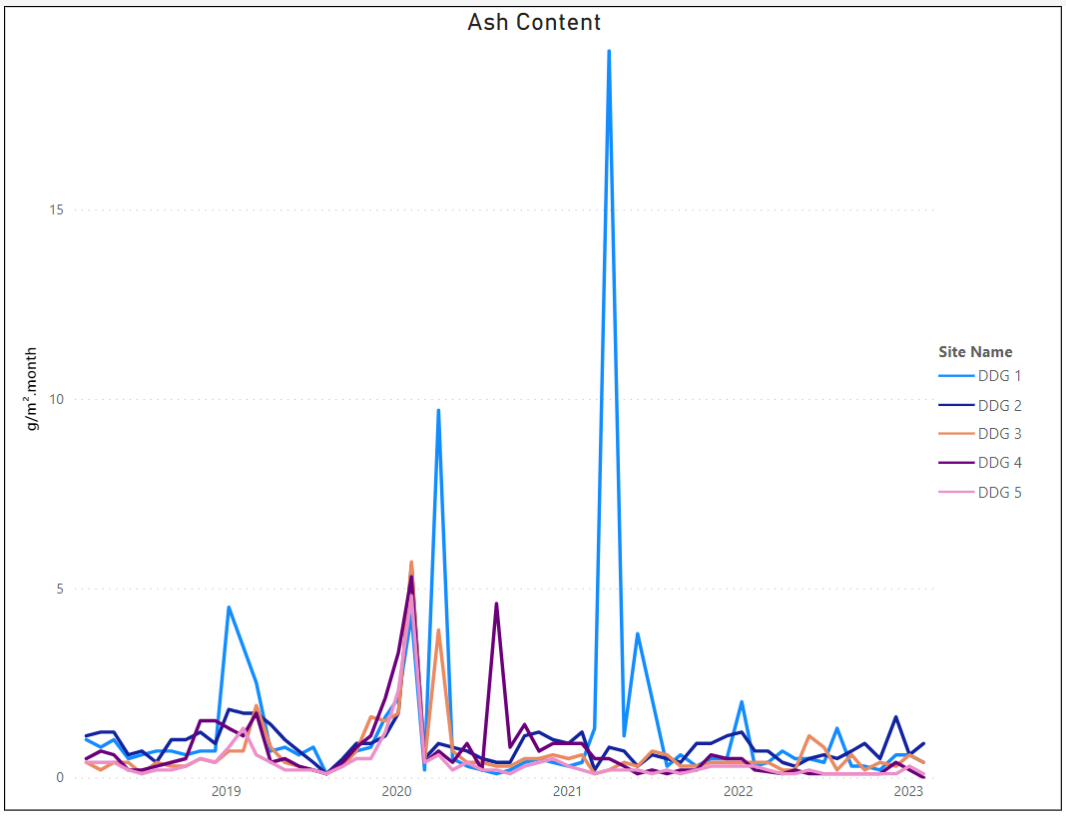
Appendix E: Dust : Tabulated Data and Trends

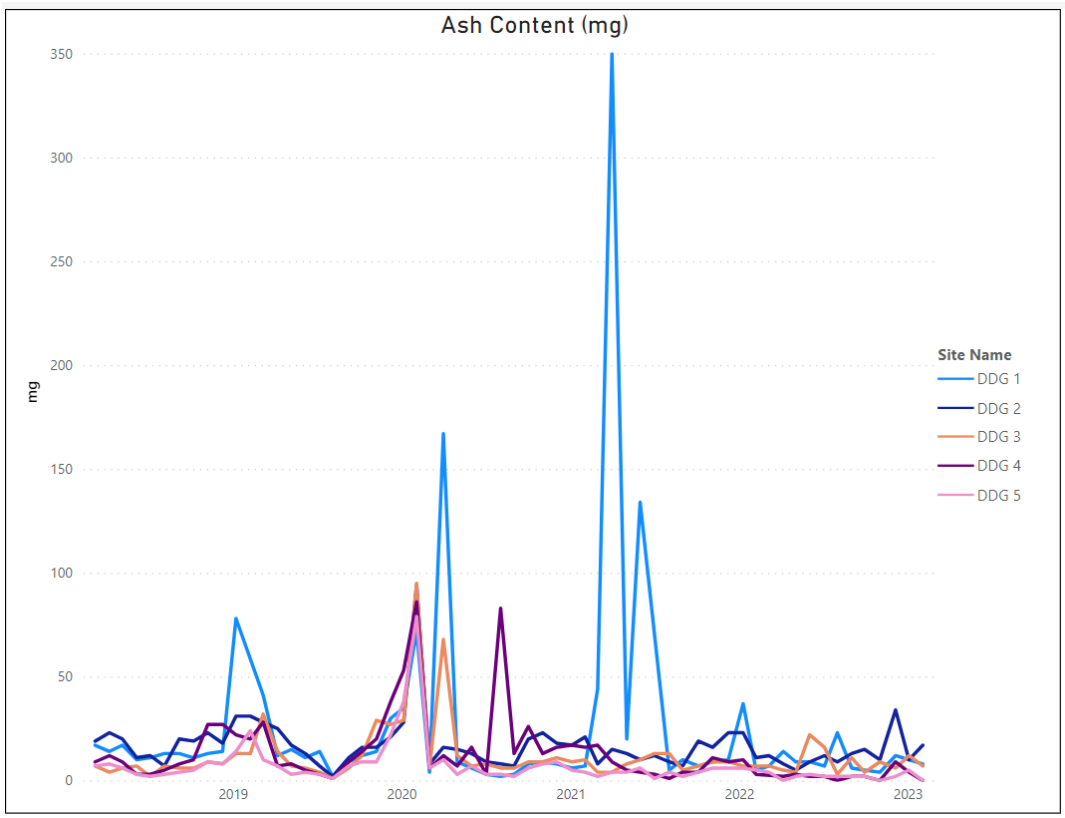
Table 1 Respirable Dust

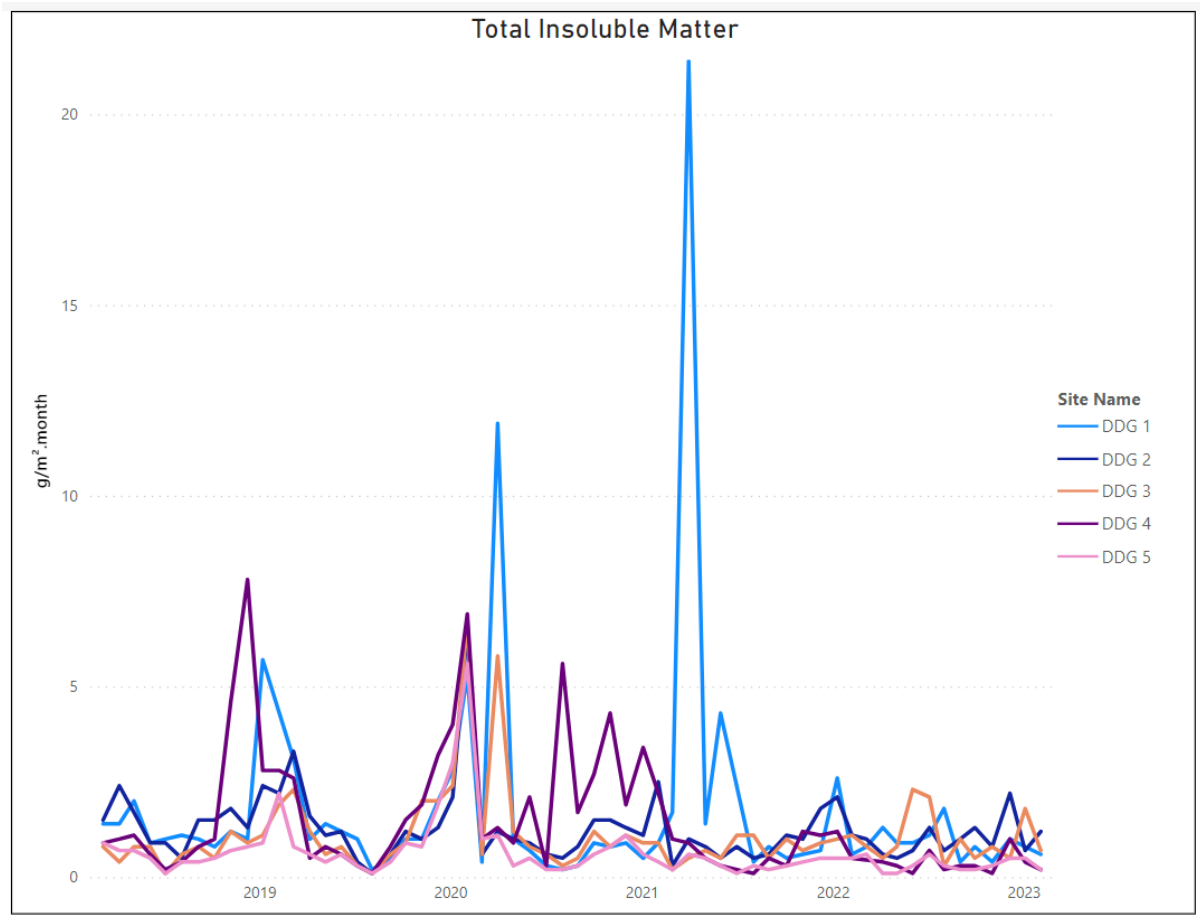
		PM10	PM10 (mass per filter)	Total Suspended Particulates	Total Suspended Particulates (mass per filter)
Units		µg/m³	mg/filter	µg/m³	mg/filter
Site Name	Sample Date				
Glengarry Cottage PM10	16/03/2022	12.7	19.0		
	19/04/2022	11.1	16.4		
	18/05/2022	6.3	9.7		
	20/06/2022	3.5	5.5		
	12/07/2022	9.1	14.1		
	01/08/2022	4.0	6.1		
	14/09/2022	21.9	33.8		
	17/10/2022	13.9	21.4		
	23/11/2022	15.2	22.9		
	12/12/2022	13.3	19.8		
	23/01/2023	17.2	25.7		
	16/02/2023	34.4	51.0		
Glengarry Cottage TSP	16/03/2022			38.6	58.6
	19/04/2022			20.9	31.3
	18/05/2022			20.0	30.9
	20/06/2022			17.1	26.7
	12/07/2022			24.8	38.3
	01/08/2022			11.3	17.4
	14/09/2022			51.6	79.8
	17/10/2022			38.4	59.4
	23/11/2022			37.9	57.3
	12/12/2022			26.0	38.8
	23/01/2023			41.1	61.9
	16/02/2023			70.7	105
Landfill PM10	17/03/2022	15.5	22.8		
	20/04/2022	2.9	4.3		
	19/05/2022	2.2	3.5		
	21/06/2022	<0.1	<0.1		
	13/07/2022	<0.1	<0.1		
	02/08/2022	8.3	12.6		
	13/09/2022	6.4	10.0		
	18/10/2022	13.1	19.6		
	24/11/2022	12.8	19.1		
	13/12/2022	11.9	16.5		
	24/01/2023	17.9	26.5		
	15/02/2023	18.7	27.7		
Landfill TSP	17/03/2022			27.9	41.4
	20/04/2022			6.8	10.3
	19/05/2022			8.6	13.4
	21/06/2022			1.9	2.9
	13/07/2022			6.6	10.2
	02/08/2022			13.9	21.2
	13/09/2022			12.7	19.8
	18/10/2022			23.8	35.9
	24/11/2022			27.8	41.6
	13/12/2022			21.8	30.3
	24/01/2023			25.4	37.8
	15/02/2023			29.5	44.0

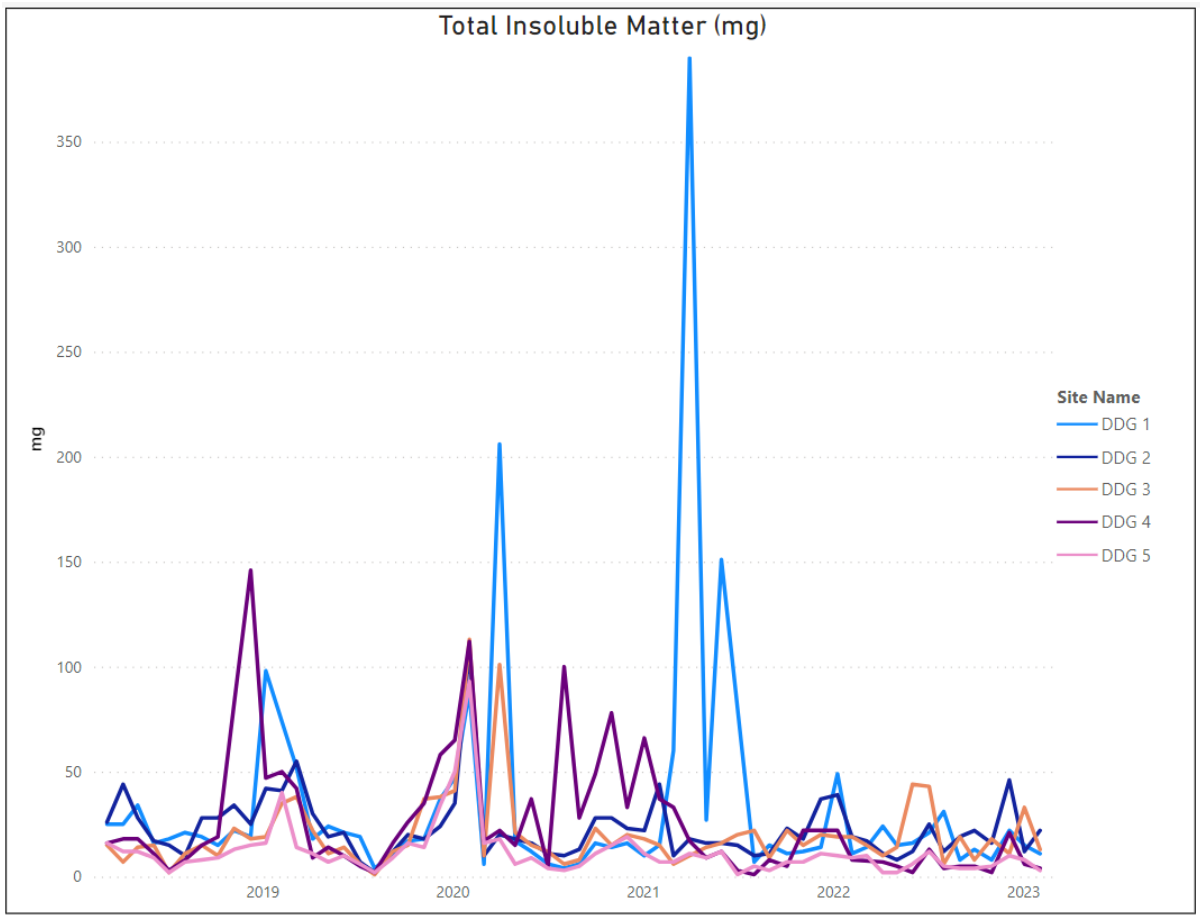
Table 2 Total Insoluble Matter

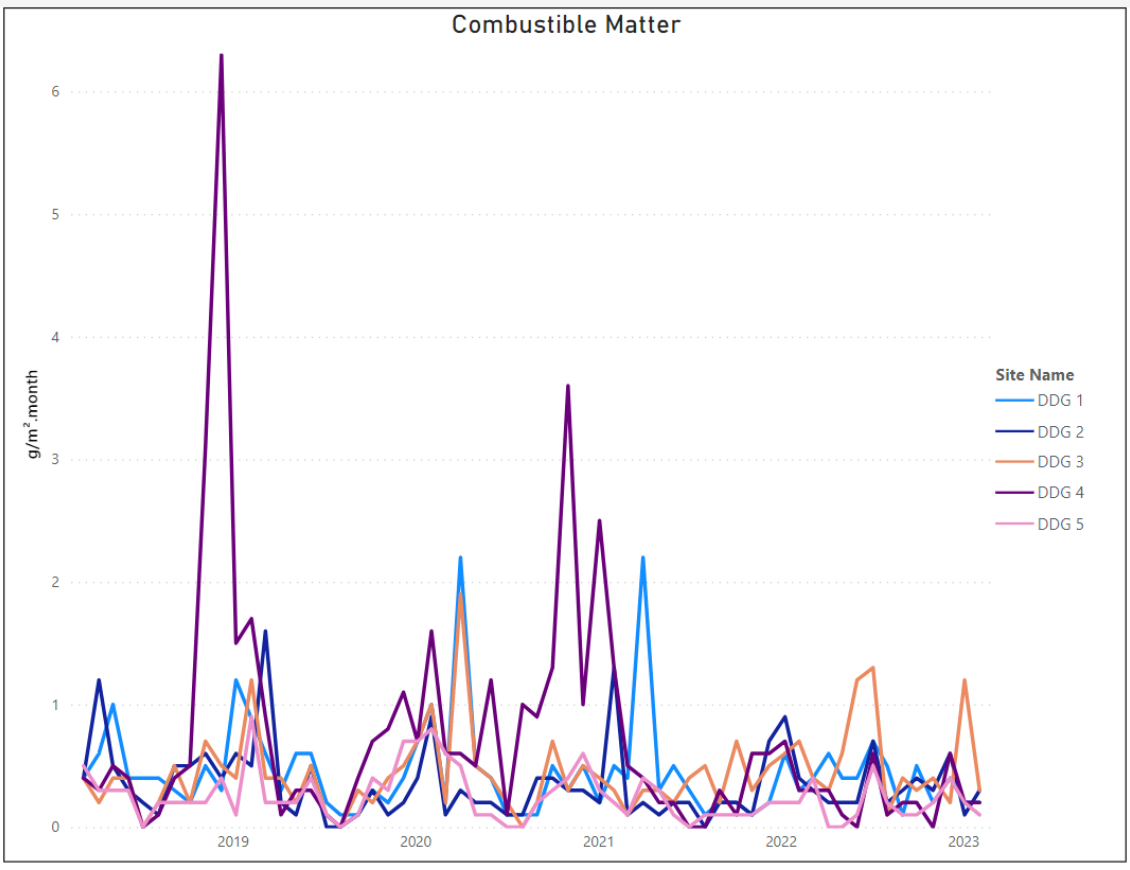
Sample Date	Chemical Name	Units	DDG 1	DDG 2	DDG 3	DDG 4	DDG 5
07/03/2022	Total Insoluble Matter	g/m^2.month	0.8	1.0	0.8		0.6
07/04/2022	Total Insoluble Matter	g/m^2.month	1.3	0.6	0.5	0.4	0.1
04/05/2022	Total Insoluble Matter	g/m^2.month	0.9	0.5	0.8	0.3	0.1
03/06/2022	Total Insoluble Matter	g/m^2.month	0.9	0.7	2.3	0.1	0.3
05/07/2022	Total Insoluble Matter	g/m^2.month	1.1	1.3	2.1	0.7	0.6
02/08/2022	Total Insoluble Matter	g/m^2.month	1.8	0.7	0.3	0.2	0.3
02/09/2022	Total Insoluble Matter	g/m^2.month	0.4	1.0	1.0	0.3	0.2
30/09/2022	Total Insoluble Matter	g/m^2.month	0.8	1.3	0.5	0.3	0.2
02/11/2022	Total Insoluble Matter	g/m^2.month	0.4	0.8	0.8	0.1	0.3
06/12/2022	Total Insoluble Matter	g/m^2.month	1.0	2.2	0.5	1.0	0.5
04/01/2023	Total Insoluble Matter	g/m^2.month	0.8	0.7	1.8	0.4	0.5
03/02/2023	Total Insoluble Matter	g/m^2.month	0.6	1.2	0.7	0.2	0.2

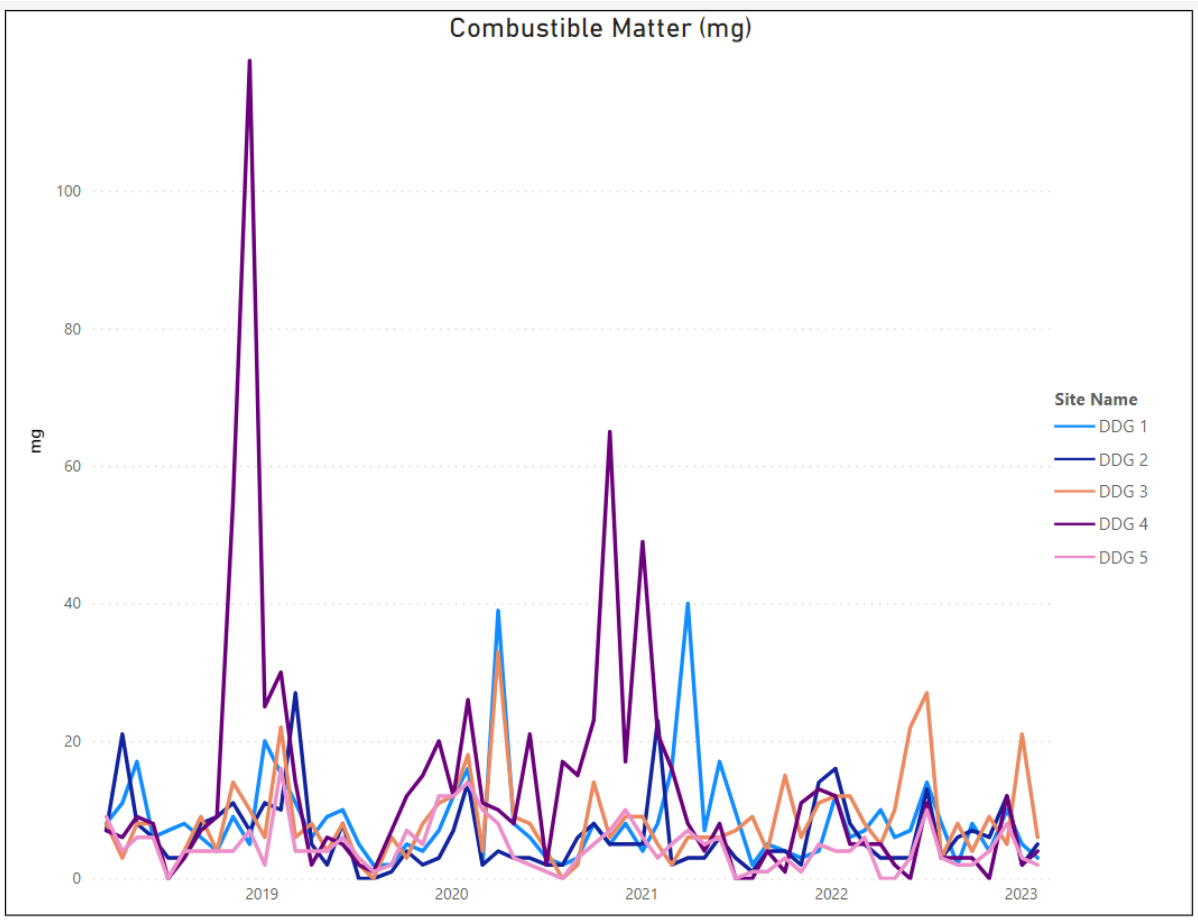


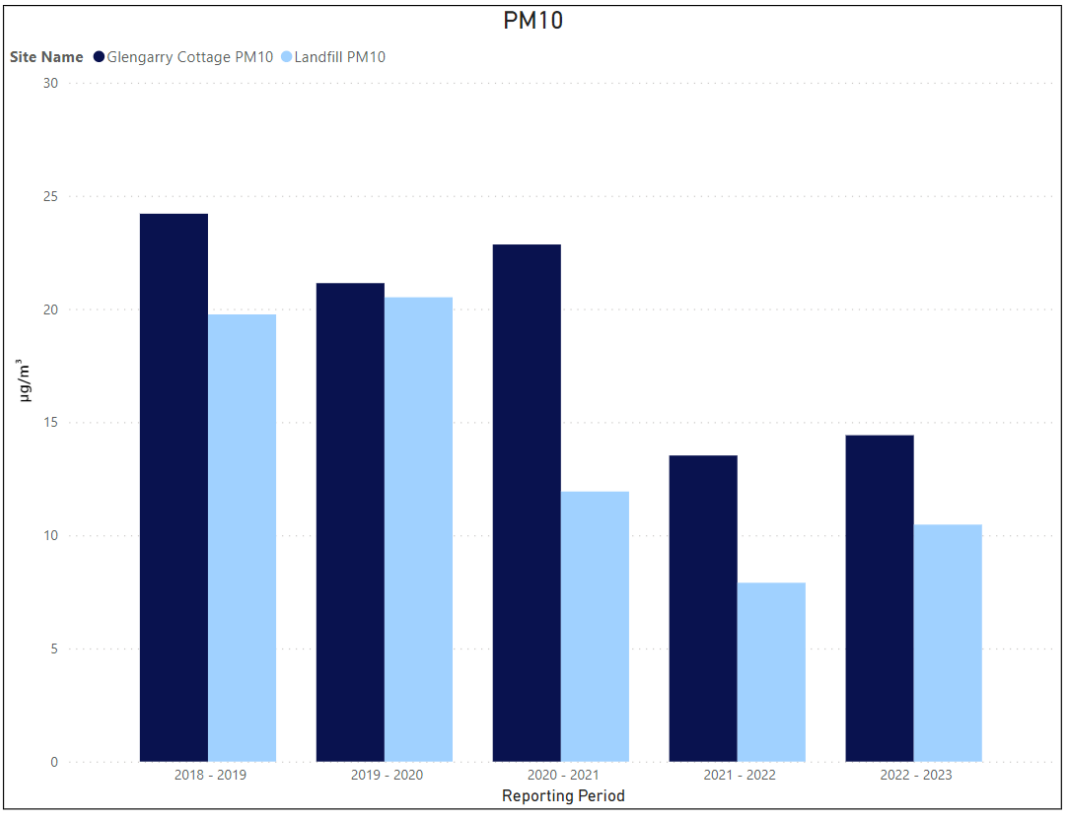

Ash Content (mg)
mg
350
300
250
200
150
100
50
0
2019
2020
2021
2022
2023
Site Name
DDG 1
DDG 2
DDG 3
DDG 4
DDG 5

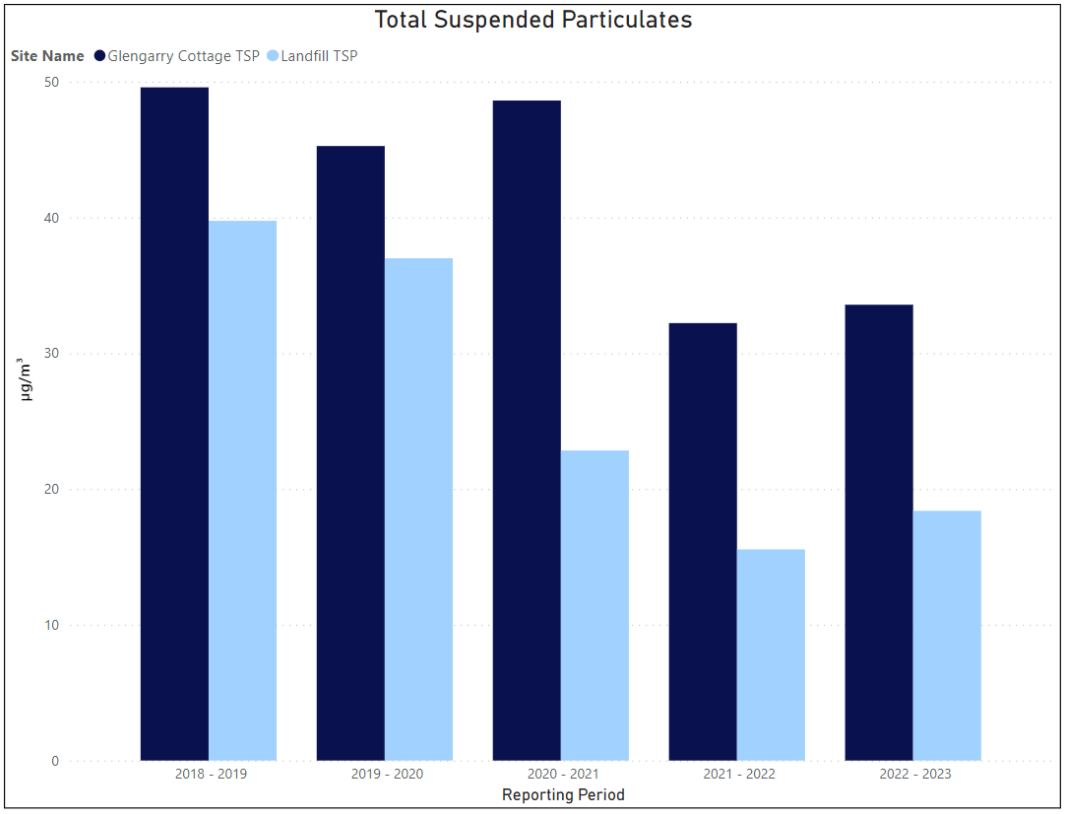

Total Insoluble Matter
g/m².month
20
15
10
5
0
2019
2020
2021
2022
2023
Site Name
DDG 1
DDG 2
DDG 3
DDG 4
DDG 5


Total Insoluble Matter (mg)
mg
350
300
250
200
150
100
50
0
2019
2020
2021
2022
2023
Site Name
DDG 1
DDG 2
DDG 3
DDG 4
DDG 5


Combustible Matter
g/m².month
6
5
4
3
2
1
0
2019
2020
2021
2022
2023
Site Name
DDG 1
DDG 2
DDG 3
DDG 4
DDG 5


Combustible Matter (mg)
mg
100
80
60
40
20
0
2019
2020
2021
2022
2023
Site Name
DDG 1
DDG 2
DDG 3
DDG 4
DDG 5


PM10
Site Name
Glengarry Cottage PM10
Landfill PM10
30
25
20
15
10
5
0
µg/m³
2018 - 2019
2019 - 2020
2020 - 2021
2021 - 2022
2022 - 2023
Reporting Period


Total Suspended Particulates
Site Name
Glengarry Cottage TSP
Landfill TSP
50
40
30
20
10
0
µg/m³
2018 - 2019
2019 - 2020
2020 - 2021
2021 - 2022
2022 - 2023
Reporting Period

Appendix F: **Odour** & Complaints

Date & Time	Source of Complaint	Type of Complaint	Description	Address
07/02/2023	EPA	Odour	Foul leachate type smell	Highview Drive, Farmborough Heights
11/02/2023	EPA	Odour	Foul leachate type smell	Highview Drive, Farmborough Heights
12/02/2023	EPA	Odour	Dreadful, strong odour of rotting vegetation	Highview Drive, Farmborough Heights
13/02/2023	EPA	Odour	Foul leachate type smell	Highview Drive, Farmborough Heights
14/02/2023	EPA	Odour	Foul leachate type smell	Highview Drive, Farmborough Heights
12/02/2023	EPA	Odour	Very horrible smell	Fairloch Avenue, Farmborough Heights
11/01/2023	EPA	Odour	Unknown	Highview Drive, Farmborough Heights
19/01/2023	EPA	Odour	Foul, garbage dump, type smell.	Highview Drive, Farmborough Heights
23/01/2023	EPA	Odour	Putrid odour	Highview Drive, Farmborough Heights
12/12/2022	EPA	Odour	Foul vomit smell	Highview Drive, Farmborough Heights
26/12/2022	EPA	Odour	Foul smell	Highview Drive, Farmborough Heights
24/09/2022	EPA	Odour	Rotting garbage smell	Farmborough Heights
24/09/2022	EPA	Odour	Rotting garbage smell	Farmborough Heights
26/09/2022	EPA	Odour	Sweet sickly smell	Farmborough Heights
01/04/2022	EPA	Odour	Strong landfill odour	Farmborough Heights